SANTO DOMINGO PUEBLO/
Bureau of Land Management

Draft Environmental Impact Statement
November 2000

U.S. DEPARTMENT OF THE INTERIOR
Bureau of Land Management
Albuquerque Field Office
Albuquerque, New Mexico

U.S. DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

United States Department of the Interior

BUREAU OF LAND MANAGEMENT
Albuquerque Field Office
435 Montaño Road, N.E.
Albuquerque, New Mexico 87107
www.nm.blm.gov

IN REPLY REFER TO:
NMNM 101521
2200 (010)

November, 2000

Dear Reader:

Enclosed for your review and comment is the Draft Environmental Impact Statement (EIS) for the Bureau of Land Management/Santo Domingo Land Exchange. This Draft EIS analyzes three alternatives for the exchange of lands owned by the Bureau of Land Management (BLM) and private lands, to be identified, from BLM's high priority acquisition areas. Your careful review and comments are needed at this time to ensure that your concerns have been considered in the exchange process.

Please direct your comments to the Albuquerque Field Manager, Edwin Singleton, at the above address. This document is subject to a 45-day review period. Written comments must be postmarked no later than January 15, 2000. Also use this address when requesting further information on materials referenced in the Draft EIS.

Comments on the alternatives and the adequacy of the impact analysis are most useful when they address one or more of the following:

- Errors in the analysis,
- New information that would have a bearing on the analysis,
- Misinformation that could affect the outcome of the analysis,
- Requests for clarification, and
- A substantive new alternative whose mix of all allocations differ from any of the existing alternatives.

Where possible, refer to the pages and paragraphs on which you are commenting.

An open house will be held from 4:00 p.m. to 7:00 p.m. on December 18, 2000, at the following location:

Bureau of Land Management
Main Conference Room
435 Montano NE
Albuquerque, NM 87107

You will be able to view maps on the proposed exchange, submit comments, and talk to representatives from the BLM and the Pueblo of Santo Domingo. Written comments will be fully considered and evaluated during preparation of the Final EIS.

Sincerely,

Edwin J. Singleton

Edwin J. Singleton
Field Manager

Enclosure

SANTO DOMINGO PUEBLO/
BUREAU OF LAND MANAGEMENT
PROPOSED LAND EXCHANGE

DRAFT ENVIRONMENTAL IMPACT STATEMENT

November 2000

U.S. DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT
ALBUQUERQUE FIELD OFFICE
ALBUQUERQUE, NEW MEXICO

BLM/NM/PL-01-002-7122

Environmental Impact Statement for
the Proposed BLM/Santo Domingo Land Exchange

Draft [X] Final [ ]

United States Department of the Interior, Bureau of Land Management

1. Type of Action: Administrative [X] Legislative [ ]

2. This Draft Environmental Impact Statement describes and analyzes three alternatives for a land exchange involving public land north of County Road 252 A (formerly State Road 22) and south of the Santo Domingo Reservation and private lands of equal value, yet to be acquired by the Pueblo, within high priority acquisition areas (as identified in the Rio Puerco and the Taos Resource Management Plans [RMPs]). The alternatives are: (A) Proposed Action (exchange public lands with a Conservation Easement), (B) Exchange public lands without a Conservation Easement, and (C) No Action Alternative.

3. Comments have been requested from the individuals, groups and agencies shown on the distribution list in Chapter 5.

4. For further information, contact:

   Debby Lucero
   Realty Specialist
   Bureau of Land Management
   435 Montano Road NE
   Albuquerque, New Mexico 87107

5. Date Draft Filed with Environmental Protection Agency: December 1, 2000

6. Comments on the Draft must be postmarked no later than: January 15, 2000

APPROVED:

Edwin J. Singleton
Manager, Albuquerque Field Office

TABLE OF CONTENTS

SUMMARY COMPARISON OF ALTERNATIVES

Element/Resource	Proposed Action	Alternative B (No Conservation Easement)	No Action Alternative
Selected Land Identified for Potential Disposal	7,376 acres with reservation of a conservation easement on all except 1,300 acres	7,376 acres without a reservation of a conservation easement -assumes 2,600 acres of sand and gravel mining and 1,500 acres of residential/businesses	Retain 7,376 acres in Federal ownership
Offered Land Identified for Potential Acquisition	-acreage, yet to be determined. -equal value based on fair market value within high priority acquisition areas	same as proposed action	N/A
Ecological Sites/Vegetation acreage maintained	6,076 acres	3,276 acres	6,076 acres
acreage disturbed	1,300 acres	4,100 acres	1,300 acres
Threatened, Endangered and other Special Status Species	No Effect	No Effect	No Effect
Water Resources water use (for sand and gravel mining only per year)	5 acre feet	43 - 77 acre feet	10 acre feet
Wildlife habitat disturbed over life of sand and gravel mining	1,300 acres	2,600 acres	1,300 acres
residential/business development	0	1,500 acres	0
Geology & Paleontology	no impacts identified	no impacts identified	no impacts identified
Mineral Resources cubic yards of sand and gravel accessible for development	31 million	63 million	160 million
cubic yards of sand and gravel not accessible due to conservation easement	129 million	97 million	0

Summary Table (Con't)

Element/Resource	Proposed Action	Alternative B (No Conservation Easement)	No Action Alternative
Land Uses			
acreage available for general public access and use	0	0	7,376 acres
acreage available for lease under the R&PP Act.	0	0	7,376 acres
acreage available for livestock grazing	7,266 acres	7,076 acres	7,376 acres
acreage available for right-of-way use under Tribal and Conservation Easement conditions	7,376 acres	7,376 acres	0
acreage available for right-of-way use under Federal regulations	0	0	7,376 acres
Wilderness			
acres of wilderness or WSA	0	0	0
Recreation			
available for non-commercial, non-competitive and non-organized activities to general public	0	0	7,376 acres
available for multiple recreational use to Pueblo membership	7,376 acres	7,376 acres	7,376 acres
Visual Resources			
acres with Visual Resource Management Classification (VRM)	0	0	7,376 acres
unclassified	7,376 acres	7,376 acres	0
Air Quality and Noise			
sand and gravel sites creating low level noise and air-borne particulate matter	1 site	2 sites	2 sites
Hazardous Materials	the ESA revealed no hazardous material sites	same as proposed action	same as proposed action
Cultural Resources			
provision for resource protection	patent reservation	patent reservation	Federal laws

Summary Table (Con't)

Element/Resource	Proposed Action	Alternative B (No Conservation Easement)	No Action Alternative
American Indian Uses privacy assured by Pueblo control	7,376 acres	7,376 acres	0
Rangeland Management current permittee use in AUM's	0	0	2,272 AUM's
Socio Economic Impacts Tribal control for privacy for traditional cultural use	7,376 acres	7,376 acres	0
loss of free general public use	7,376 acres	7,376 acres	0
Value of sand and gravel to be developed, at current price $1.10 per cubic yard	$34,606,000	$69,212,000	$1,769,828,000
Value of sand and gravel that would not be developed, at current price $1.10 per cubic yard	$1,735,222,000	$1,700,616,000	$0

CHAPTER 1

PURPOSE AND NEED

INTRODUCTION

The Albuquerque Field Office of the Bureau of Land Management (BLM) is proposing to exchange more than 7,000 acres of public land in Sandoval and Santa Fe Counties for private lands of equal value. The proposed action is a land exchange between the BLM and the Pueblo of Santo Domingo. The proposed exchange would occur under the authority of the Federal Land Policy and Management Act of 1976 (FLPMA), as amended by the Federal Land Exchange Facilitation Act of August 20, 1988 (FLEFA). (See Appendix C for summaries of these laws.)

The proposed action involves the BLM exchanging approximately 7,376 acres of Federal surface and subsurface estate north of County Road 252A (formerly State Road 22) and south of the Santo Domingo Reservation (see Map 1) to the Santo Domingo Pueblo. The pueblo in turn would transfer to the BLM private lands of equal value. A conservation easement (see Appendix I) would be retained in Federal ownership on all the selected lands except for approximately 1,300 acres.

For purposes of this [draft] environmental impact statement (EIS), Federal lands selected for acquisition by the Pueblo are called "Selected Lands." Private lands are called "Offered Lands" where we refer to lands to be offered by the Pueblo to BLM in exchange for the selected lands. The proposed land exchange is explained in more detail in Chapter 2 (Proposed Action and Alternatives).

The BLM has developed this Draft EIS to address the probable environmental impacts that would happen if this exchange were to occur.

NEED FOR THE PROPOSED ACTION

The Selected Lands that would leave Federal ownership are mainly in Sandoval County in BLM's Albuquerque Field Office jurisdiction, a small part on the east end is in Santa Fe County (see Map 1). The lands to be acquired by the Federal government will be under the jurisdiction of the Albuquerque or Taos field offices.

Completing the proposed exchange would enhance BLM's land ownership consolidation in this area of New Mexico. The exchange would also help reduce conflicts between public land users and private land owners, eliminate inappropriate development of private inholdings in specially designated areas, and increase BLM's management flexibility. In addition, the Santo Domingo Pueblo would acquire lands that have been identified as having significant traditional cultural values to them.

CONFORMANCE WITH LAND USE PLANS

Land ownership adjustments were one of the critical issues that drove the preparation of two land use plans for BLM's Albuquerque District a few years ago: the Rio Puerco Resource Management Plan (RMP; USDI, BLM, 1986) and the Taos RMP (USDI, BLM, 1988b). According to these RMPs, consolidating the public land to improve resource manageability is the highest priority for the Lands and Realty Program in the Albuquerque Field Office. Both the Rio Puerco and Taos RMPs (as amended) identified certain non-public lands within specially managed areas that the BLM would like to acquire to augment various resource programs.

In addition to the guidance outlined in the RMPs, the Statewide Wilderness Final Environmental Impact Statement (USDI, BLM, 1988a) further identified non-public lands within and adjacent to certain wilderness study areas (WSAs) for future acquisition by the Albuquerque District. Land ownership adjustments through exchanges are the BLM's preferred method for achieving these objectives.

This proposed action is subject to the Rio Puerco RMP (approved November 1986, maintained and reprinted October 1992). As required by 43 CFR 1610.5, the Proposed Action Alternative of this Draft EIS has been reviewed to ensure that it conforms with the terms and conditions of the RMP.

The Rio Puerco RMP categorizes lands in three different management classes: (1) Management Class A lands represent the highest priority for BLM retention or acquisition based on natural and cultural resources values and/or opportunities to improve management by consolidating land ownership patterns. (2) Management Class B lands are identified for retention by the BLM. While Class B lands are not a high priority for consolidation, they can be made available for exchange to acquire non-public lands in high priority (Management Class A) retention zones.

(3) Public lands identified for disposal are categorized as Management Class C. The Taos RMP does not distinguish between the three management classes; it categorizes lands as either for disposal or retention/acquisition.

All of the selected land is identified as Management Class B in the Rio Puerco RMP.

This proposed action is in conformance with both the Rio Puerco and Taos RMP's.

(All of the documents referenced previously are available for public review at the BLM's Albuquerque Field Office, 435 Montaño NE, Albuquerque, NM.)

CHAPTER 2

PROPOSED ACTION AND ALTERNATIVES

ALTERNATIVE A (Proposed Action Alternative)

The proposed action is a land exchange between the BLM's Albuquerque Field Office and the Pueblo of Santo Domingo. The exchange would take place under the authority of the Federal Land Policy and Management Act of 1976 (FLPMA), as amended by the Federal Land Exchange Facilitation Act of August 20, 1988 (FLEFA).

The Proposed Action Alternative involves the BLM exchanging approximately 7,376 acres of Federal surface and subsurface estate north of County Road 252A (formerly State Road 22) and south of the Santo Domingo Reservation (see Map 1) to the Santo Domingo Pueblo. The Santo Domingo Pueblo would transfer to the BLM private lands of equal value, yet to be acquired by the Pueblo, within high priority acquisition areas with priorities given to ACEC's, WSA's National Conservation Area, habitat management and other special management areas (as identified in the Rio Puerco and the Taos Resource Management Plans [RMPs]).

The Selected Lands would be transferred in fee to the Pueblo and eventually would become lands managed by the Bureau of Indian Affairs (BIA) in trust. A conservation easement, to be managed by the BIA, would be retained in Federal ownership on all the Selected Lands except for approximately 1,300 acres within Sections 25, 26 and 35, Township 14 North, Range 6 East NMPM (see Map 1). These lands have been identified by the pueblo for probable development of sand and gravel. The purpose of the conservation easement is to conserve important habitat for wildlife, to protect rare or unique native plants now or later identified, to conserve the diverse vegetative communities and the wildlife inhabiting these communities, and to preserve the lands in their present condition, but without interfering with any uses of the property by the Santo Domingo Pueblo consistent with the protection of the conservation values.

The patent transferring the Selected Lands would also contain a reservation protecting historic properties consistent with the National Historic Preservation Act (P.L. 89-665; 80 Stat. 915; 16 U.S.C. 470; as amended; see Appendix D) until the lands are transferred to the United States in trust for the benefit of the Santo Domingo Pueblo.

Except for the conservation easement to be reserved on most of the Selected Lands, both surface and subsurface estates would be transferred, ensuring that management problems were minimized and a future exchange would not be necessary.

A small portion of a BLM rights-of-way corridor, approximately three miles in length, crosses through the center of the Selected Lands. The corridor was designated in the resolution of the Rio Puerco RMP Rights-of-Way Corridors Issue as a preferred location for future transmission line placements (see Map 2). The corridor was designed to prevent haphazard rights-of-way placement and to reduce adverse environmental impacts. The corridor would be included in the transfer to the Santo Domingo Pueblo.

The Sandoval County-claimed road, County Road 252A (formerly State Road 22), within the Selected Lands would be issued a right of way before the exchange would occur. Landowners' access would be established through agreements with the Santo Domingo Pueblo. Map 3 shows the roads identified by landowners as being historical access roads within the Selected Lands.

The Santo Domingo Pueblo would transfer private lands to the BLM which they would purchase within certain blocks of lands identified as high priority acquisition areas. The value of the Offered Lands would equal the value of the Selected Lands described previously. The lands to be purchased by the Pueblo are within areas identified as Management Class A in the Rio Puerco RMP which are the field office's highest priority for consolidation of public lands. Other lands identified for possible purchase by the Pueblo are within high priority acquisition areas administered by the Taos Field Office.

The Offered Lands that the BLM would acquire within Special Management Areas (SMAs) would become incorporated into the specific specially designated area. Any lands acquired within Wilderness Study Areas (WSAs) would be managed under the Interim Management Policy for Lands Under Wilderness Review (USDI, BLM, 1995). Lands acquired within a withdrawal area will be subject to the terms and conditions of that withdrawal. The Offered Lands in other areas would be managed under the principal of multiple use consistent with the RMP. If necessary, additional NEPA analysis would be conducted on the Offered Lands.

The Selected Lands that would leave Federal ownership are within the area administered by the BLM's Albuquerque Field Office. The lands to be acquired by the Federal government will be within the areas administered by Albuquerque and/or Taos Field Offices. Completing the proposed exchange would enhance the BLM land ownership consolidation, reduce conflicts between public land users and private property owners eliminate

inappropriate development of private inholdings in specially designated areas, and increase management flexibility for the BLM.

ALTERNATIVE B (No Conservation Easement)

Alternative B is essentially the same as Alternative A except that the conservation easement would not be reserved; the following is a detailed explanation of the alternative.

Alternative B is a land exchange between the BLM and the Pueblo of Santo Domingo. The exchange would occur under the authority of FLPMA, as amended by FLEFA. This alternative involves the BLM exchanging approximately 7,376 acres of Federal surface and subsurface estate north of County Road 252A (formerly State Road 22) and south of the Santo Domingo Reservation (see Map 1) to the Santo Domingo Pueblo. The Santo Domingo Pueblo would transfer to the BLM private lands of equal value, yet to be acquired by the Pueblo, within high priority acquisition areas as identified in the Rio Puerco RMP and certain parcels identified in the Taos RMP. The Selected Lands would be transferred in fee to the Pueblo, and eventually would become lands managed by the BIA in trust.

The patent transferring the Selected Lands would contain a reservation protecting historic properties consistent with the National Historic Preservation Act (P.L. 89-665; 80 Stat. 915; 16 U.S.C. 470; as amended) until the lands are transferred to the United States in trust for the benefit of the Santo Domingo Pueblo.

Both surface and subsurface estates would be transferred, ensuring that management problems were minimized and a future exchange would not be necessary.

A small portion of a BLM rights-of-way corridor, approximately three miles in length, crosses through the center of the Selected Lands. The corridor was designated in the resolution of the Rio Puerco RMP Rights-of-Way Corridors Issue as a preferred location for future transmission line placements (see Map 2). The corridor was designed to prevent haphazard rights-of-way placement and to reduce adverse environmental impacts. The corridor would be included in the transfer to the Santo Domingo Pueblo.

The Sandoval County-claimed road, County Road 252A (formerly State Road 22) within the Selected Lands, would be issued a right of way before the exchange would occur. Landowners' access would be established through agreements arrived at with the Santo Domingo Pueblo. Map 3 shows the roads identified by landowners as being historical access roads within the Selected Lands.

The Santo Domingo Pueblo would transfer private lands to the BLM which they would purchase within certain blocks of lands identified by the BLM as high priority acquisition areas. The value of the Offered Lands would equal the value of the Selected Lands described previously. The lands to be purchased by the Pueblo are within areas identified as Management Class A in the Rio Puerco RMP which are the field office's highest priority for consolidation of public lands. Other lands identified for possible purchase by the Pueblos are within high priority acquisition areas administered by the Taos Field Office. The Offered Lands that the BLM would acquire within SMAs would become incorporated into the specific specially designated area. Any lands acquired within WSAs would be managed under the Interim Management Policy and Guidelines for Lands Under Wilderness Review (USDI, BLM, 1979). Lands acquired within a withdrawal area will be subject to the terms and conditions of that withdrawal. The Offered Lands in other areas would be managed under the principal of multiple use consistent with the RMP. Additional NEPA analysis will be conducted on the Offered Lands.

The Selected Lands that would leave Federal ownership are within the area administered by the Albuquerque Field Office, The lands to be acquired by the Federal government will be within the areas administered by Albuquerque and/or Taos Field Offices. Completion of the proposed exchange would enhance the BLM land ownership consolidation, reduce conflicts between public land users and private property, eliminate inappropriate development of private inholdings in specially designated areas, and increase management flexibility for BLM.

This alternative assumes that mining would be developed on an additional 1,300 acres and residential/business development would occur on 1,500 acres of the selected lands. These lands would be accessible through County Road 252A (formerly State Road 22).

ALTERNATIVE C (No Action Alternative)

Under the No Action Alternative, the proposed land exchange would not occur. The BLM would not benefit from consolidation of the public lands in high priority acquisition areas.

Federal grazing allotments and recreation would continue as they are now. Any royalties stemming from potential sand and gravel mining on the Selected Lands would be for the benefit of the United States.

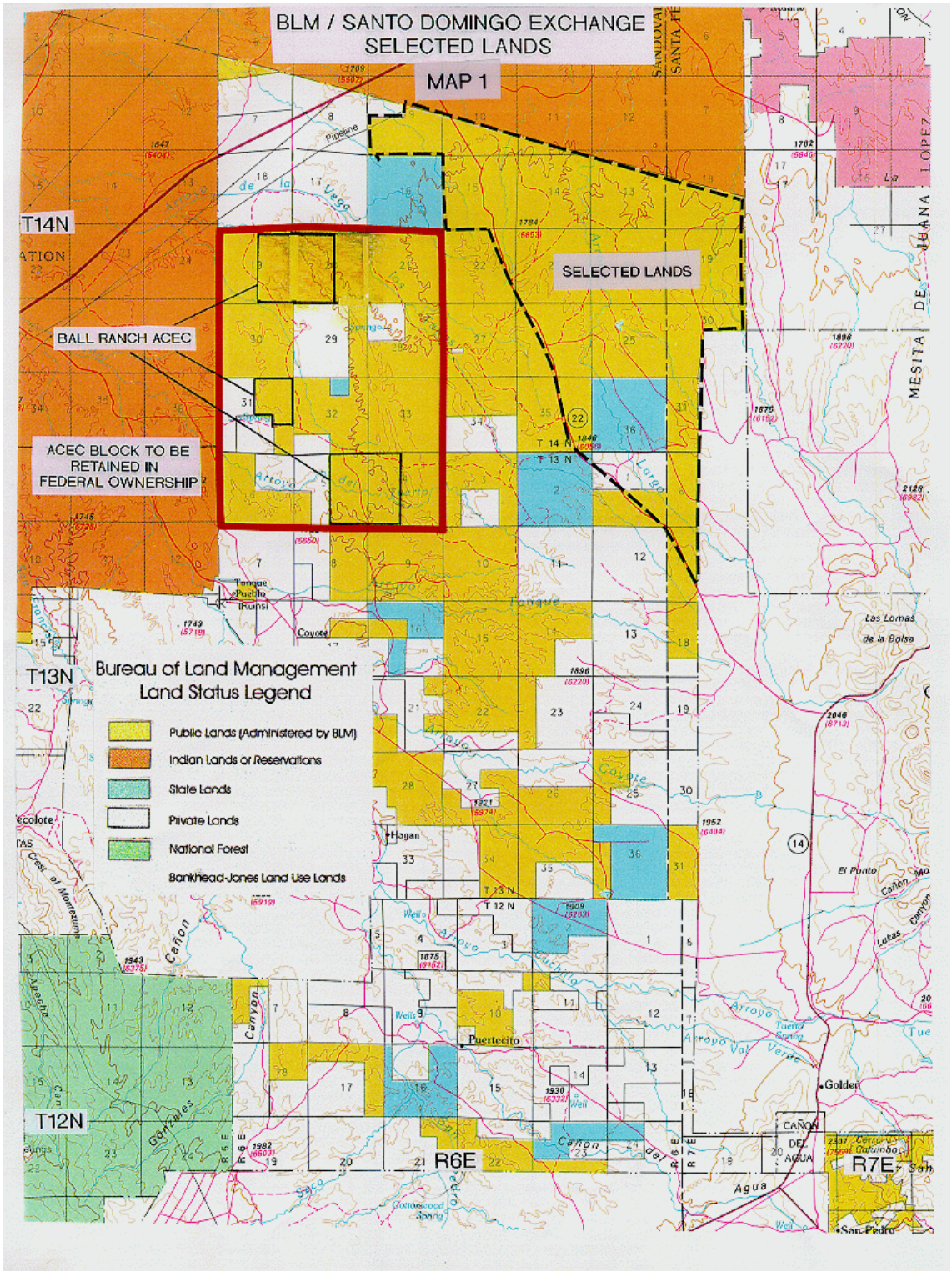
ALTERNATIVES CONSIDERED BUT DROPPED FROM FURTHER ANALYSIS

During 1998, a three-way land exchange was proposed involving both the Santo Domingo and San Felipe Pueblos and the State of New Mexico. The exchange involved the Selected Lands and other surrounding public lands as well as State lands within BLM SMAs from an identified list including a parcel within the Petroglyphs National Monument. The exchange was proposed to satisfy the debt owed the State as a result of the Santa Ana land transfer and to consolidate lands in and adjacent to specially managed areas including the Petroglyphs National Monument.

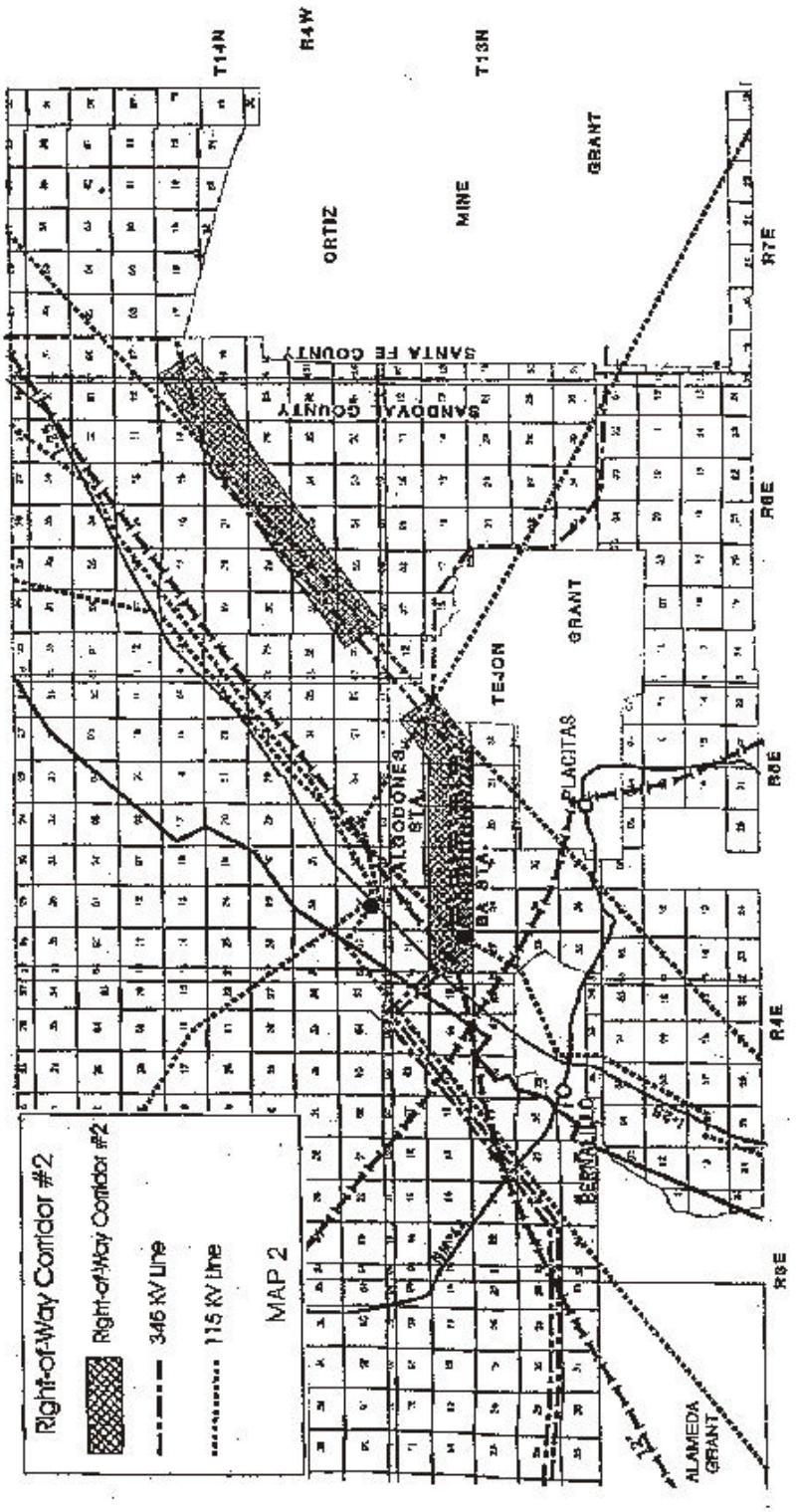
The public lands in the exchange considered involved approximately 18,295 acres of Federal surface and subsurface in the area of the Selected Lands. Under this three-way exchange, the Ball Ranch ACEC block would have been retained in Federal ownership. The value of the 18,295 acres the BLM proposed to transfer to the Pueblos was to be placed in an escrow account, which would have been used to purchase private or other lands of equal value for transfer to the State. The State would then have transferred scattered State lands of equal value (chosen by the BLM from an identified list) to the BLM.

This proposal was dropped from further consideration after the State Land Office identified other BLM disposal lands that would more prudently help them meet the State's trust mission (. . . "to sustain the health, diversity, and productivity of the resources and lands entrusted to us for the use and enjoyment of present and future generations through balanced management within the framework of the law."). All parties agreed to drop this proposal from further consideration to propose three separate land exchanges with the BLM and each of the three parties.

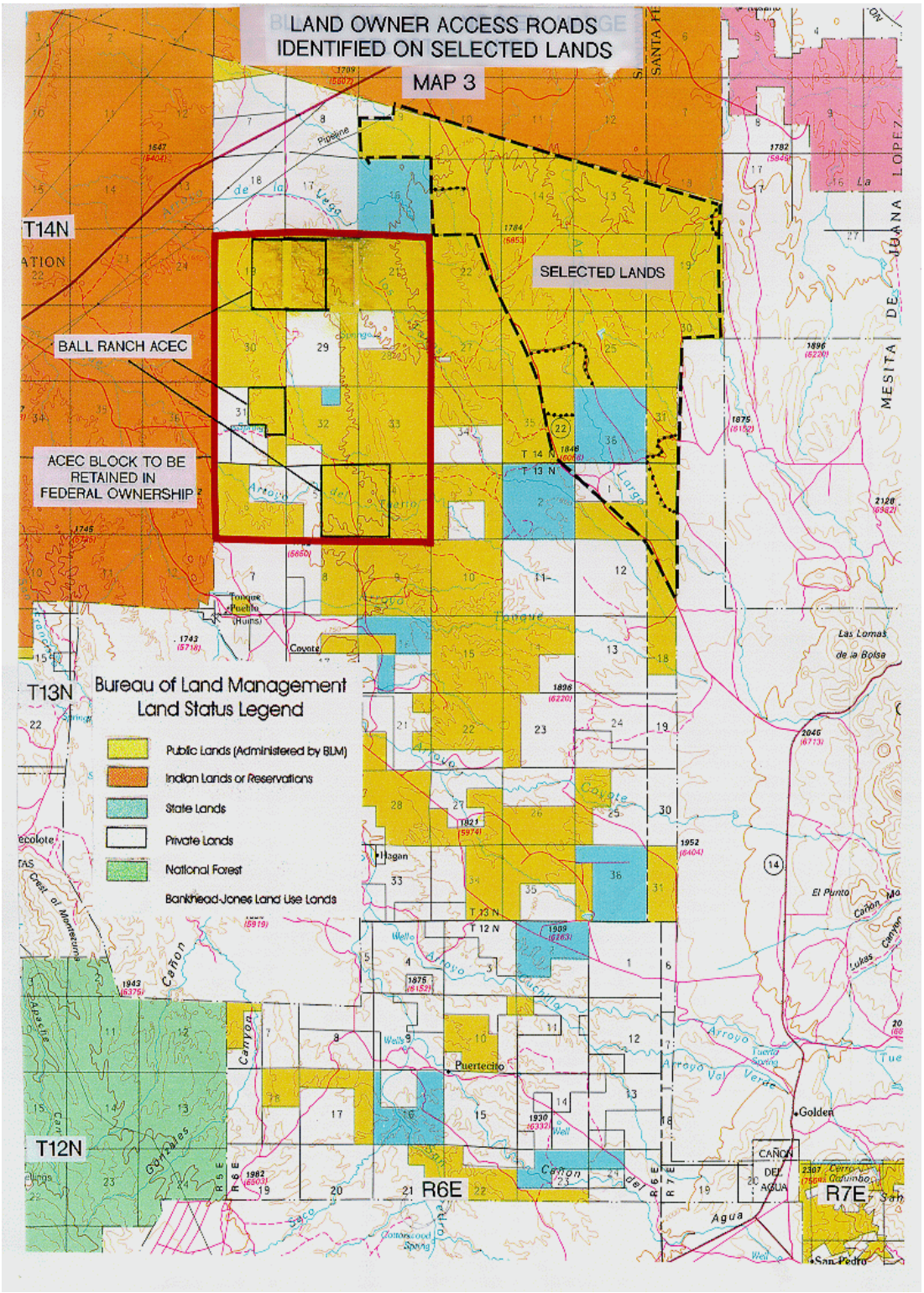
MAP 1–SANTO DOMINGO EXCHANGE SELECTED LANDS



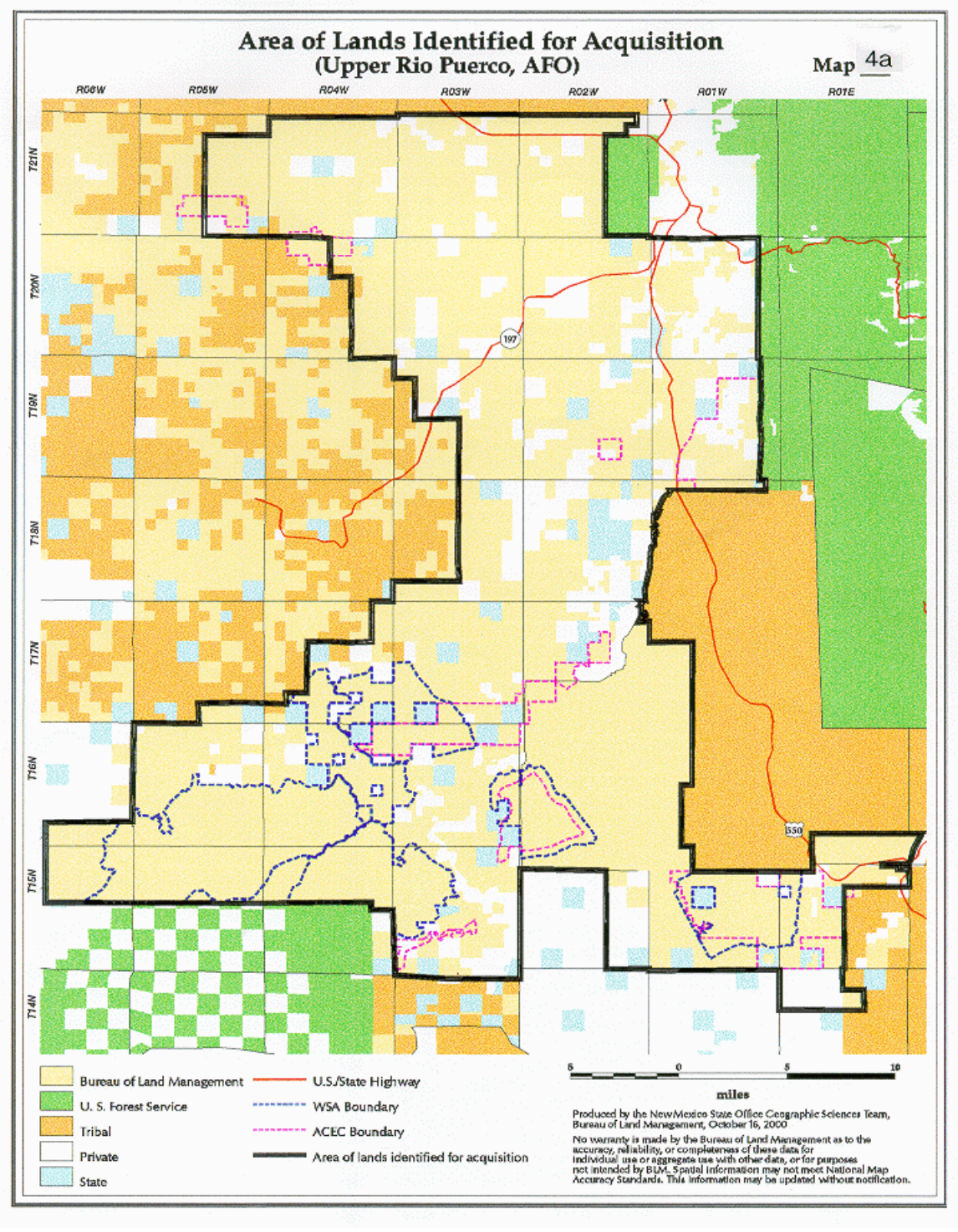
MAP 2--RIGHT-OF-WAY CORRIDOR #2



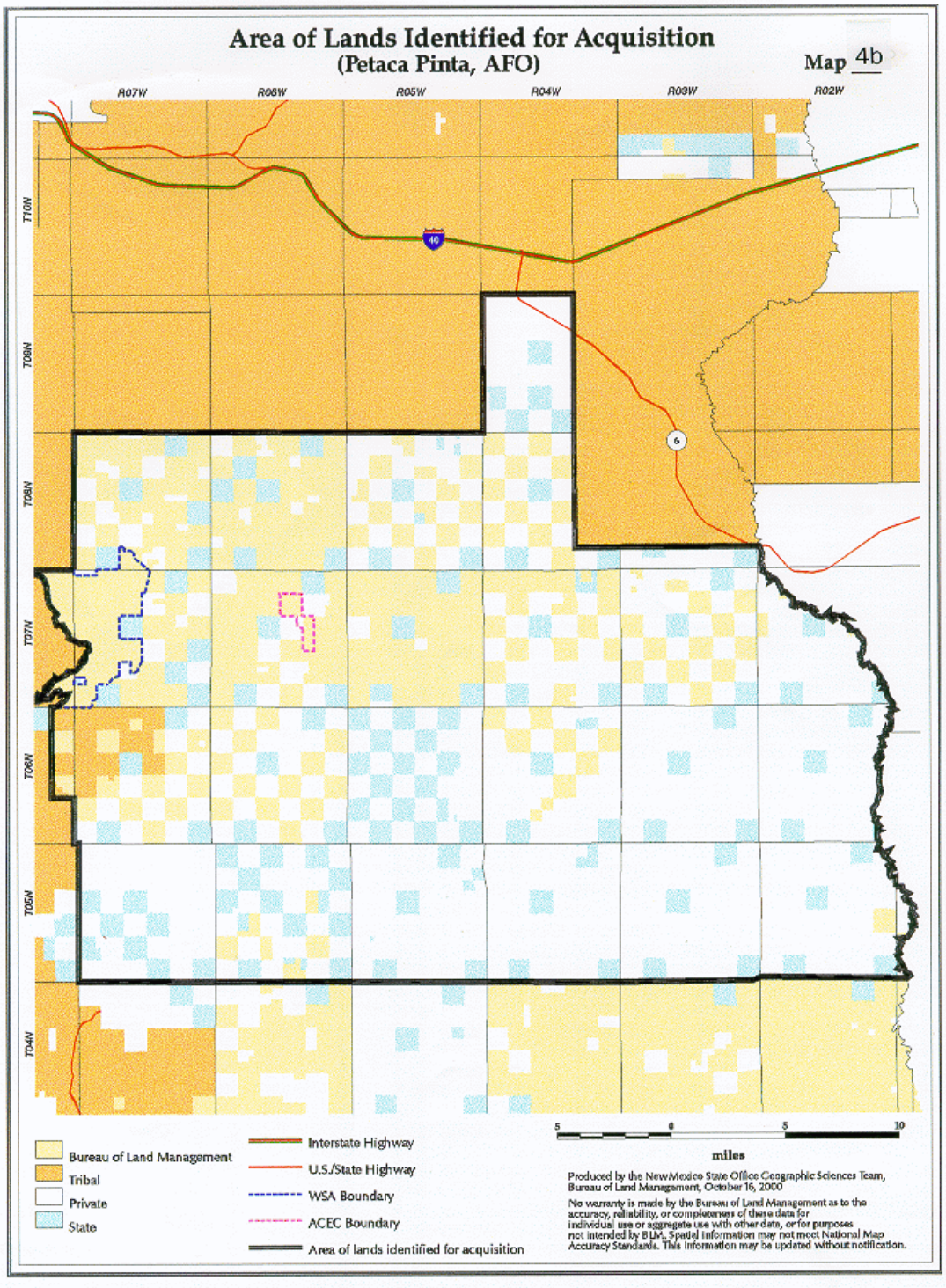
MAP 3-- LAND OWNER ACCESS ROADS IDENTIFIED ON PUBLIC LANDS



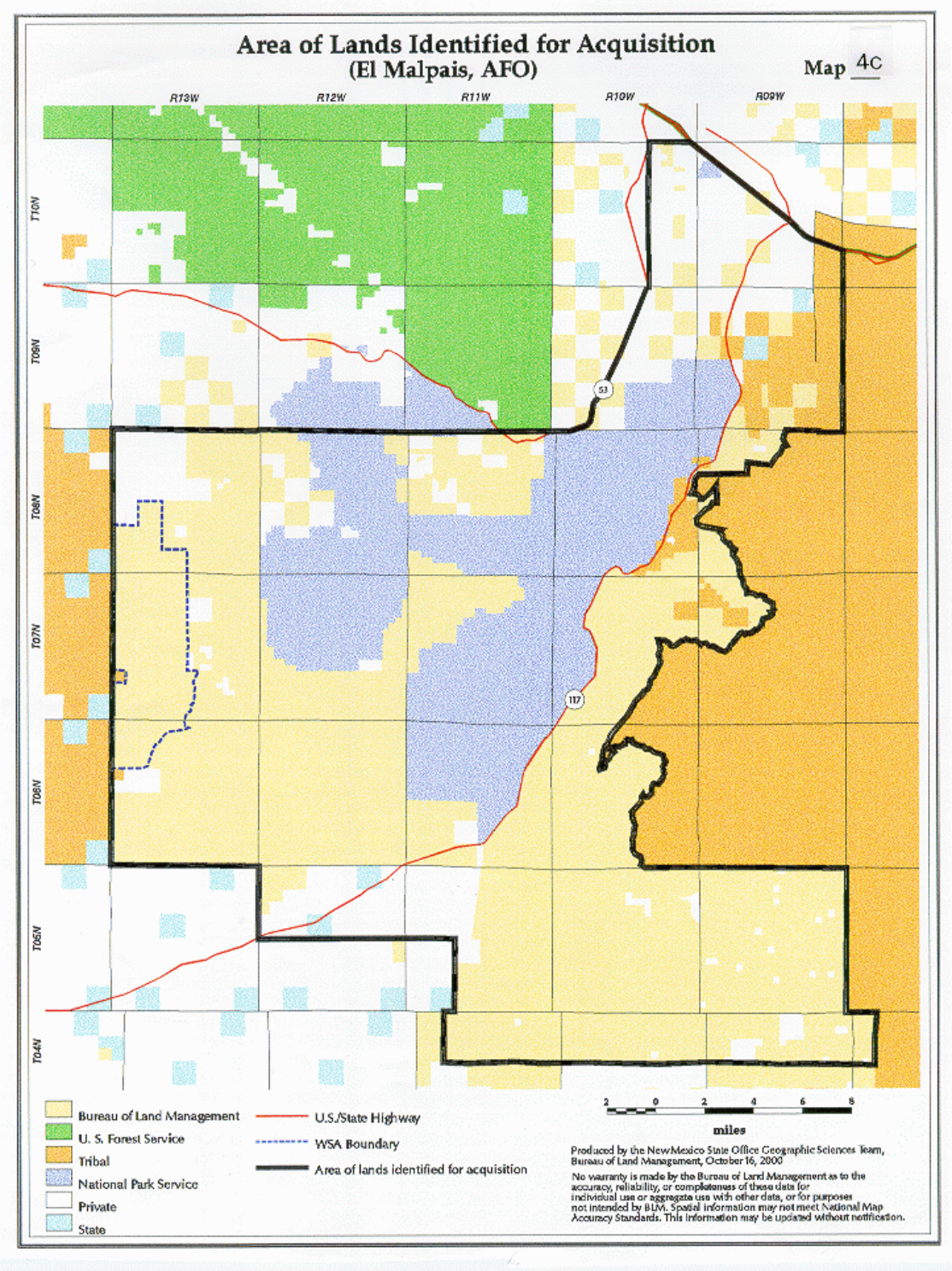
MAP 4a--AREA OF LANDS IDENTIFIED FOR ACQUISITION (Upper Rio Puerco, AFO)



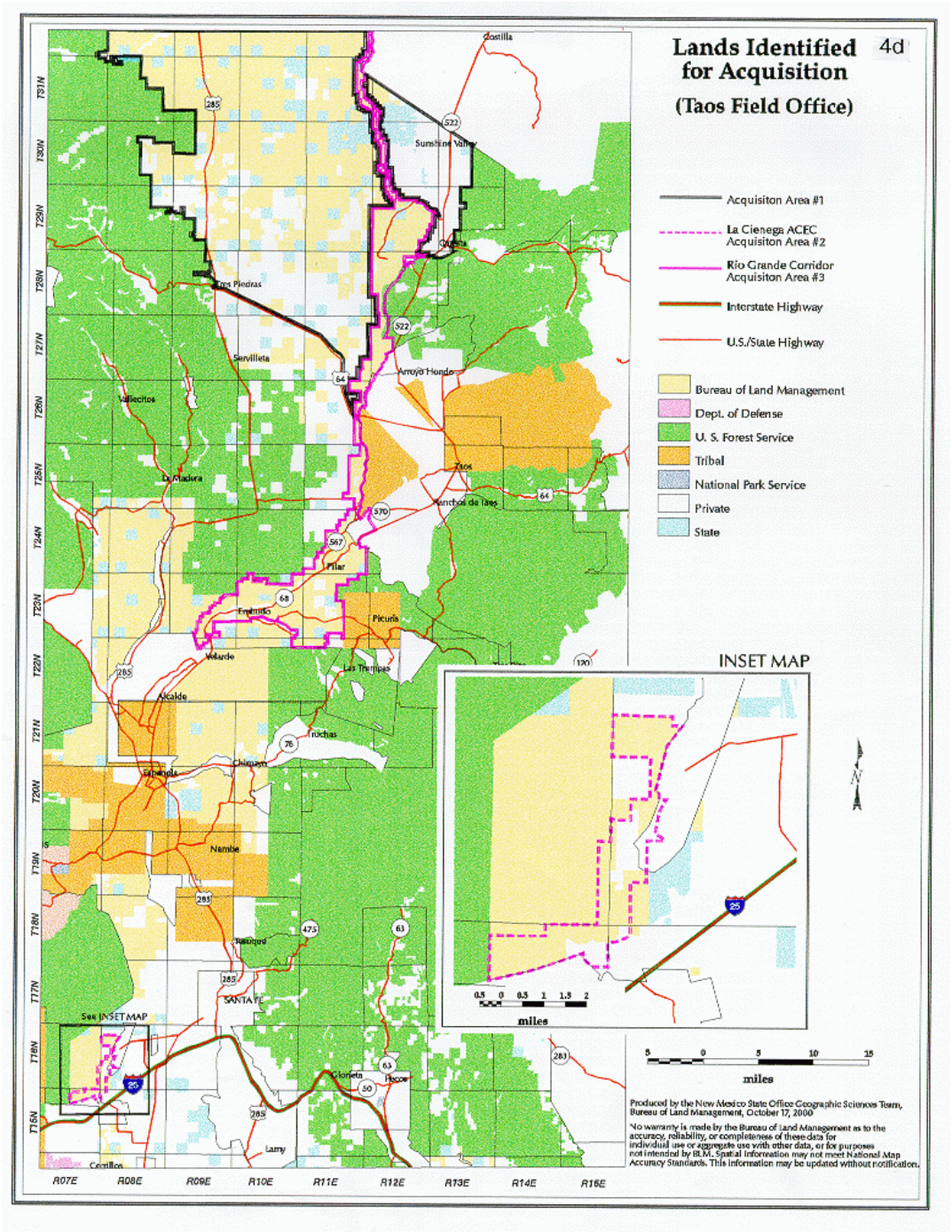
MAP 4b-- AREA OF LANDS IDENTIFIED FOR ACQUISITION (Petaca Pinta, AFO)



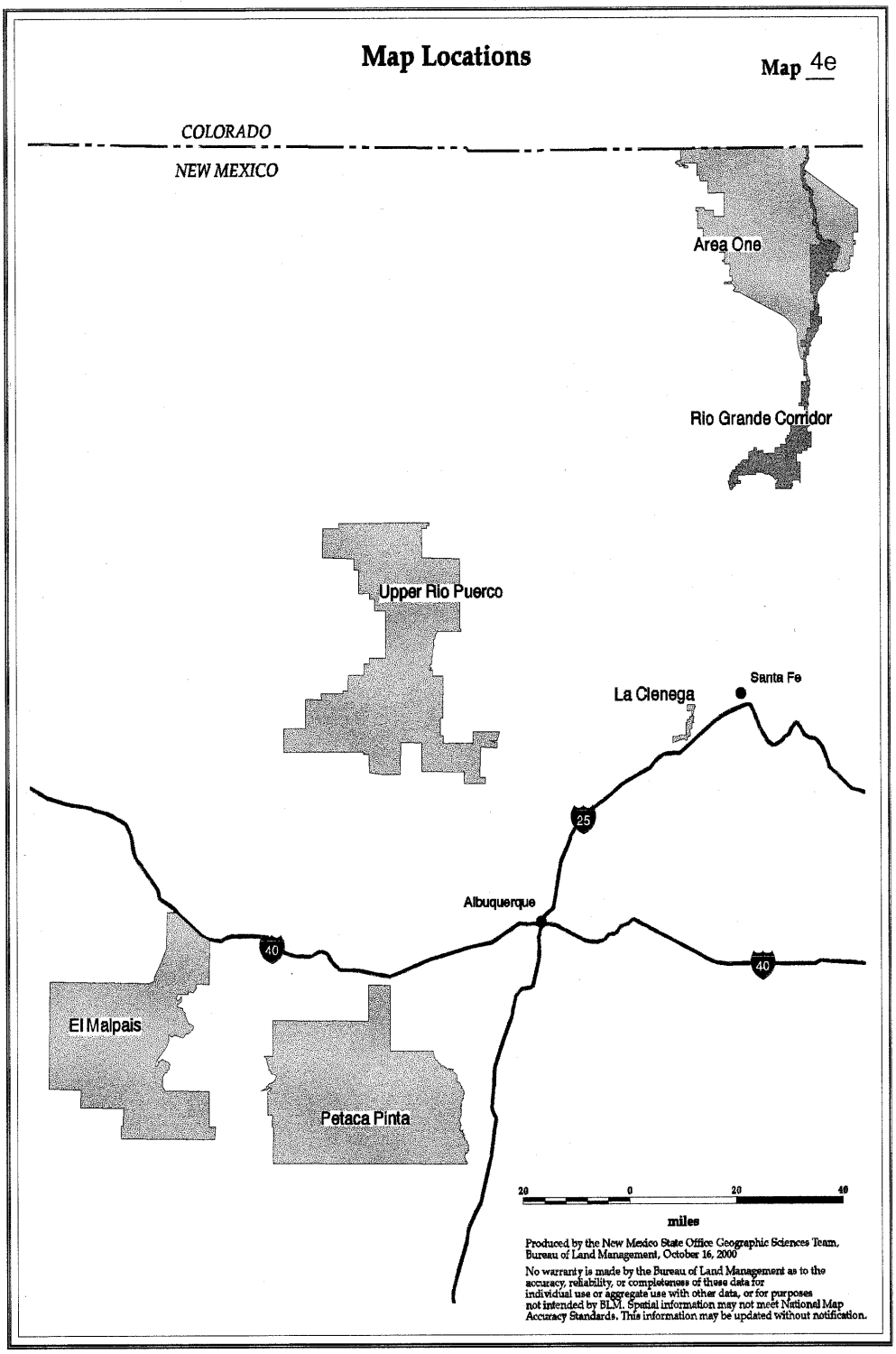
MAP 4c–AREA OF LANDS IDENTIFIED FOR ACQUISITION (El Malpais, AFO)



MAP 4d -- LANDS IDENTIFIED FOR ACQUISITION



MAP 4e– MAP LOCATIONS



CHAPTER 3

AFFECTED ENVIRONMENT

INTRODUCTION

This chapter describes the current resources and enviromental conditions of the proposed land exchange area. It will also identify opportunities for resource use or management and constraints to resource use and management.

As previously mentioned in the Introduction in Chapter One and for purposes of this EIS, Federal lands selected for acquisition by the Pueblo are called "Selected Lands." Private lands are called "Offered Lands" where we refer to lands to be offered by the Pueblo to BLM in exchange for the Selected Lands.

SANTO DOMINGO PUEBLO SETTING

Located on the east bank of the Rio Grande, about 30 to 35 miles southwest of Santa Fe and about 30 miles northeast of Albuquerque, the Indians of Santo Domingo Pueblo (the Keresans) have occupied this area of the Rio Grande Valley since prehistoric times despite several floods that have forced relocation and reconstruction of the original pueblo. Strategically located along the roads that have led to La Bajada ("the slope," or the lower lands), this Pueblo and its people have played an important role in the history of the Camino Real from early Spanish times to the modern State and Federal highways.

REGIONAL SETTING

Selected Lands

Selected Lands comprised of approximately 7,376 acres are located in Sandoval and Santa Fe Counties. The lands are approximately 30 miles northeast of Albuquerque, New Mexico and are bounded by the Santo Domingo Reservation to the north. The Selected Lands are well consolidated.

No prime or unique farmlands are located on or near any of the selected lands; therefore, the proposed action would not affect this value. It was also assumed that no impacts to climate, topography and transportation, would result from this proposed land exchange.

Offered Lands

Offered Lands associated with this proposed exchange are individual sections or groups of sections lying within and adjacent to blocks of public land. Much of this public land is formally designated WSAs, ACECs, and SMAs (see Appendix C).

As stated in the Rio Puerco and Taos RMPs (USDI, BLM, l986 and 1988), acquiring these offered sections would assist in consolidating public ownership in areas where there are outstanding wilderness, recreational, wildlife, riparian, and cultural resources values. Therefore, the manageability of the land ownership pattern would be improved. These lands, if transferred to Federal ownership, would receive resources protection under the current RMPs, ACEC plans, Interim Management Policy for Lands under Wilderness Review (USDI, BLM 1995), and other Federal mandates. The lands acquired within a withdrawn area will be subject to the terms and condition of that withdrawal.

By eliminating mixed BLM/private ownership, the proposed exchange would consolidate ownership of public lands in these areas, resulting in a more manageable land ownership pattern within and adjacent to WSAs, ACECs, SMAs and other high priority acquisition areas and it would also permit more resources protection by BLM's Albuquerque and Taos Field Offices.

NATURAL ENVIRONMENT

Ecological Sites/Vegetation (Selected Lands)

The elevation on the Selected Lands within the proposed exchange area ranges from 5,853 feet to 6,066 feet. Low hills and mesas bisected by arroyos characterize the topography. These lands contain two broad vegetative communities: grasslands and juniper-savanna.

These broad categories can be further subdivided by delineating five ecological sites for the two broad communities (see Table 3-1). (An ecological site is defined as land with specific physical characteristics that set it apart from another piece of land.) The five ecological sites within the affected environment are: l) grassland--loamy, 2) juniper-savanna--limy, 3) juniper-savanna--gravelly, 4) juniper-savanna--hills, and 5) juniper-savanna--breaks.

Components that define these physical characteristics include landform and soil type or texture. The physical characteristics of these sites support specific vegetative communities. These physical characteristics and the vegetative communities they support are summarized in Table 3-2.

Ecological Sites/Vegetation (Offered Lands)

The Offered Land tracts within the affected environment are located in four major ecosystems: 1) riparian-wetlands, 2) grasslands, 3) sagebrush-grasslands, and 4) piñon-juniper woodlands.

Threatened, Endangered and Other Special Status Species (Selected and Offered Lands)

Six federally listed threatened and endangered, one proposed, 33 species of concern (BLM sensitive), and 22 State of New Mexico threatened and endangered species are known or potentially could occur on public lands within Sandoval County (USDI, FWS 2000; NMDG&F 1998; Sivinski and Lightfoot, 1995). However, because of the land ownership patterns and the specific habitats used by these species, they may occur within the broad borders of Sandoval and Santa Fe Counties but not occur within the Santo Domingo/BLM proposed land exchange area.

The federally listed, proposed, and BLM sensitive species that are known to occur within northern New Mexico include: American and Arctic peregrine falcon, bald eagle, mountain plover, Western burrowing owl, loggerhead shrike, and ferruginous hawk. Also, the American and Arctic subspecies of the peregrine falcon are known to pass through northern New Mexico during spring and fall migrations. The bald eagle has been known to migrate through the general area; however, the area is outside of the bald eagle's normal range, which is along the Rio Grande corridor. The mountain plover is found throughout northern New Mexico where ever short-grass prairies are found. And the Western burrowing owl, loggerhead shrike, and ferruginous hawk occur throughout the area wherever their particular habitat sites (e.g., prairie dog towns and open piñon-juniper savannas) occur.

The following serves only as an example of the general vegetative/habitat communities and the potential listed, proposed and BLM sensitive species that could occupy these communities within the area. Many of the more mobile species (i.e., birds and bats) can use several different communities throughout the year.

Shrub-Grassland Community: The species of the shrub-grasslands include the bald eagle, Western burrowing owl, ferruginous hawk, loggerhead shrike, and various species of bats. In addition, many species of bats use the shrub-grasslands as foraging areas.

Piñon-Juniper Woodland Community: None of the species appears to be limited or especially dependent upon the piñon-juniper woodland community. However, ferruginous hawks are known to use piñon and juniper trees for nesting purposes, and many species of bats use this community as foraging habitat.

When the offered parcels become BLM lands they will be treated as other public lands and all requirements of the Endangered Species Act will be followed.

TABLE 3-1

ECOLOGICAL SITES FOUND ON SELECTED LANDS

Ecological Sites	Landform	Soil Textures	Vegetative Communities
Grasslands Loamy	Level to strongly sloping piedmont (5-15% slope)	Sandy to clay loam Contains clay, silt, sand & organic matter	Grasses blue grama bottlebrush squirreltail galleta western wheatgrass Shrubs broom snakeweed fourwing saltbush winterfat
Juniper-Savanna Limy	Level to strongly sloping piedmont (5-15% slope)	Sandy to clay loam Contains clay, silt, sand & organic matter Highly calcareous (contains lime)	Grasses black grama New Mexico feathergrass sideoats grama Shrubs Bigelow sage broom snakeweed fourwing saltbush winterfat
Juniper-Savanna Gravelly	Tops of slopes of higher elevation hills (5-15% slope)	Loam to sandy loam with gravels throughout soil profile Contains clay, silt & sand Coarse components: gravel, cobble & stone	Grasses black grama blue grama hairy grama New Mexico feathergrass sideoats grama Shrubs Apache plume skunkbush sumac soapweed yucca
Juniper-Savanna Hills	Rolling to steep hills (15-75% slope, average slope 20-30%)	Loam, clay & sandy loams with coarse components Contains clay, silt & sand Coarse components: gravel, cobble & stone	Grasses black grama little bluestem New Mexico feathergrass sideoats grama silver bluestem Shrubs algerita mountain mahogany oak skunkbush sumac
Juniper-Savanna Breaks	Steep slopes of mesas & canyons (average slope 40-50%)	Cobbly to very stony loam Contains clay, silt & sand Coarse components: cobbles & stone	Grasses blue grama hairy grama little bluestem sideoats grama wolftail grama Shrubs gray oak mountain mahogany skunkbush sumac

TABLE 3-2

ECOLOGICAL SITES FOUND ON PRIMARY GROUPS OF OFFERED LANDS

Riparian-Wetlands	Grasslands	Sagebrush-Grass	Piñon-Juniper Woodlands
Señorito Canyon (RPRA) Cerros Colorados segment of Rio Puerco Cerro Cuate segment of Rio Puerco Elk Springs ACEC La Cienega ACEC	Ball Ranch ACEC La Lena WSA Canon Tapia ACEC Cabezon WSA Ojito ACEC Ojo Caliente SMA Warm Springs SMA La Cienega ACEC Burnt Corn Pueblo El Malpais NCA	San Antonio WSA San Antonio SMA Dos Valles area Eagle Mesa area	Wild Rivers Recreation Area Pot Mountain (Cerro del Olla) area El Pueblo SMA Petaca Pinta WSA El Malpais NCA

Water Resources (Selected Lands)

No perennial streams exist within the proposed exchange area. However, an ephemeral channel system does cut northwesterly across the proposed exchange area. Arising on the flanks of the Ortiz Mountains to the east, long and nearly parallel channels such as Arroyo Largo carry storm water and sediment to Galisteo Creek and then into the Rio Grande.

The most dependable source of water resources in the area is ground water. The recent surface erosional deposits are usually less than 100 feet thick and generally not water bearing. These deposits cover the major aquifer or water-bearing units in the area, the basin fill deposits of the Santa Fe Group, divided into three units--Upper, Middle and Lower. The Upper and Lower Units have low ground-water production potential. The Upper Santa Fe unit usually is not saturated and the Lower Santa Fe unit is characterized by fine- to medium- grained material such as clays, silty sands, and interbedded sands and silty clays with local conglomeratic or gravelly zones.

The Middle Santa Fe Group unit has the greatest comparative potential for water production in the area. That potential is based on an estimated local saturated thickness of 1,000 to 2,000 feet and a saturated horizontal hydraulic conductivity of not more than four feet per day. Water production would also depend on the quality of well design and construction. The ground water in this group generally flows northwest to the Rio Grande.

The next geologic unit below the Santa Fe Group is the Espinaso Formation, composed of volcanic sediments that have a dense mudstone matrix and low to very low potential for ground-water production. The Espinaso serves primarily as a barrier to ground-water movement. This formation was uplifted and exposed along the eastern border of the exchange area by the Tano Fault. (For a more detailed explanation of the hydrogeologic situation see the report in Appendix E.)

The three wells on BLM lands and the one well on state lands apparently produce enough water to support current livestock operations. Three wells are shallow with depths ranging from 300 to 500 feet, the depth on one well is unknown, and the permit for the fifth (test) well specified its planned depth would be 1,000 feet. The latter would reach the Middle Santa Fe unit while the others are probably using a local water table or are situated on the Upper-Middle Santa Fe Group boundary.

BLM does not own any water rights within the proposed exchange area. However, the New Mexico Office of the State Engineer lists three claims of private water rights and one test well on BLM lands. The stated uses are domestic and livestock with a total appropriation claim of 62 acre feet per year. Under New Mexico water law, an appropriation water right is considered property and can be owned separately from the land. As property, a water right can be sold or transferred with approval by the Office of the State Engineer. On BLM lands, the water rights and land are separated by ownership.

Water Resources (Offered Lands)

The highest priority areas for land ownership consolidation were delineated in the Rio Puerco and Taos Resource Area Management Plans (RMPs). Until the offered lands are identified no inventory of natural resources on these lands will be made. Water resources in the offered lands areas are most likely to consist of ephemeral

channels, stock tanks, and livestock wells. There may be opportunities to acquire reaches of perennial streams and riparian areas. The BLM would be interested in acquiring any water rights associated with these lands.

Wildlife (Selected Lands)

An open, arid juniper-piñon woodland Kuchler ecosystem type with some livestock water troughs provides habitat capability for about 119 animal species in the Selected Lands area. Reliable water in the proposed area for most wildlife is either not present or not accessible due to the height of the cattle troughs. Overall, about two amphibian, 44 bird, 36 mammal and 37 reptile species would be expected to be associated with the local ecosystems.

Of the 44 species of migratory birds associated with the local ecosystems, 37 are neotropical migratory birds (see Glossary, Appendix F). The selected lands would be expected to provide stopover habitat for between 50 and 100 additional migrant species during the spring and fall migrations.

Wildlife (Offered Lands)

The Offered Lands would most likely contain one or more of the following Kuchler ecosystem types: grama-galleta steppe grassland, Great Basin sagebrush shrubland, juniper-piñon woodland, or pine-Douglas fir forest.

Several hundred wildlife species associated with these ecosystems exist within BLM's Albuquerque Field Office area. The species present come from among a possible 11 species of amphibians, 205 species of birds, 96 species of mammals, and 46 species of reptiles.

Since nearly all bird species associated with the Albuquerque Field Office area are migratory birds, about 200 potential species exist on the offered lands plus another 50 to 100 stopover migrants during the spring and fall migrations.

Geology/Paleontology (Selected Lands)

The Selected Lands lie approximately at the center of north-central New Mexico, along the eastern flank of the Rio Grande Rift System. The rift is composed of a series of north-trending *en echelon* grabens (down-dropped or offset blocks). This region is characterized by volcanic plateaus, dissected alluvial basins, and uplifted mountain ranges. Sedimentary, igneous, and metamorphic rocks, ranging in age from Precambrian to Quaternary, are present.

Also found within the Selected federal Lands are deposits of finely-preserved petrified wood and, deposits of mesozoic marine bivalve shells. The coarse-grained deposits outside of the federally retained area are unlikely to contain well-preserved verebrate fossil material.

Geology/Paleontology (Offered Lands)

Physiographically, the Offered Lands are located in the Southern Rocky Mountain Province, the Intermontane Plateau, and the Basin and Range Plateau.

The Southern Rocky Mountain Province includes only a small part of north-central New Mexico, terminating at the south end of the Nacimiento Mountains and the Sangre de Cristo Range (north of Glorieta Mesa at the northeastern part of the study area). This Province includes parts of two major structures, the Tusas Uplift and the Rio Grande Trough (rift). Landforms common to this province include flat open mesas, arroyos, rolling foothills, mountainous areas, steep canyon rims and terraces, and gorges. Stratigraphics of the area include volcanic pyroclastics, Tertiary age flood basalts, and alluvial deposits resting directly on Precambrian rocks.

The Intermontane Plateau contains two sections of the Colorado Plateau Province: (1) The Navajo section, located in northwestern New Mexico, consists of mesas, cuestas, rock terraces, retreating escarpments, arroyos, canyons, and the structural San Juan Basin. The stratigraphy of the area is characterized by outcrops of sandstone with lesser amounts of shale subjected to erosion. (2) The Datil section to the south includes stream-dissected mountain ranges, depositional slopes and flats, alluvial fans, erosional surfaces, lacustrine and basinal structures, and volcanic centers. Sedimentary and igneous rocks ranging in age from Cretaceous to Quaternary are present.

The Mexican Highland division of the Basin and Range Plateau consists of high desert and intermountain areas. These areas contain fault-block mountains, basalt flows, mesas composed of sandstone and shales, canyons with narrow valley floors, river floodplains, and level to undulating piedmont slopes and plains. A wide range of lithologies is present in this division, including valley alluvium, incised Cretaceous and Tertiary rocks, and floodplain and stream-channel deposits derived from uplift areas.

For stratigraphic details on formation/member exposures on some of the offered lands, see the *New Mexico Statewide Wilderness Study* (USDI, BLM, 1988a). (For definitions of some of the above geologic terms, please see Appendix F.)

Minerals (Selected Lands)

Locatable mineral activity in the Selected Lands area has included uranium and gold; however, neither of these minerals is currently being produced. The uranium potential in the selected area is low-moderate to less favorable or unknown (McLemore, 1984; Gray, 1989). Currently in the Selected Lands area, no active mining claims for gold or other locatable metals and non-metals exist. Potential for base and precious metals and other locatables in the selected area is less favorable or unknown (Gray, 1989).

Saleable minerals include sand and gravel, limestone, gypsum, and other industrial minerals. In the Selected Lands area, the potential exists mainly for sand and gravel mining, while limestone, gypsum, and other saleable minerals are produced nearby. There is petrified wood present nearby, but most of this is confined to the Ball Ranch ACEC area. Most sand and gravel mined in the general area is found in young terrace and pediment deposists of the Rio Grande floodplain. However, sand and gravel do occur within the selected area in Quaternary age pedimental deposits. The proximity of the Rio Grande floodplain deposits to Albuquerque, land status and access, and other economic factors possibly have prevented sand and gravel mining in the selected land area to date.

Leasable mineral activity in the selected area has been for oil and gas and nearby coal mining. Coal in the area is found in the Una del Gato field (aka, Hagan field), a faulted, eastward-dipping homocline located between the Sandia and Ortiz mountains. Most coal mined in the area has been mined south of the selected lands. The final Federal oil and gas leases in the area expired in April and August 2000.

Minerals (Offered Lands)

Some of the private lands that BLM would acquire would probably be incorporated into specially designated areas. Consequently, no surface disturbance, including mining, would occur on these lands.

Land Uses (Selected Lands)

Current and potential uses of the federal lands analyzed in the EIS are domestic livestock grazing, right-of-way (ROW) development, oil and gas leasing, mineral material (sand & gravel) sales, wildlife habitat, outdoor recreation, cultural resource management, and for Recreation & Public Purpose Act (R&PP) additions to State and local governments and qualified non-profit organizations. Past activities include coal mining, oil and gas drilling, and uranium exploration. During the last three years, some requests by the public for sand and gravel sales have also been received. The land is managed by the BLM under the principles of multiple use and sustained yield.

Certain areas of the federal lands are occupied by various facilities (ROW's) authorized by the BLM. Listings of ROW's and other rights to be reserved are contained in Appendix I.

The need for new ROW development on the public lands arises occasionally, usually in relation to access roads to service nearby private parcels and utility facilities (powerlines, pipelines), or for roads and highways to service outlying areas. The New Mexico Highway and Transportation Department notified the BLM of a corridor study being initiated through the proposed federal lands for a highway connection between Interstate 25 and State Road 14. In addition, the Public Service Company of New Mexico has also notified BLM of a proposed right of way plan through the federal lands for a natural gas line from Bernalillo to Santa Fe.

A portion of the Selected Lands contain a right-of-way corridor that was designated in the resolution of the Rio Puerco RMP Rights-of-Way Corridors Issue as a preferred location for future transmission line placements. (Rights-of-way corridors were designed to prevent haphazard rights-of-way placement and to reduce adverse environmental impacts.) The corridor contains two powerlines authorized to PNM.

Private Lands Adjacent to the DEIS Proposed Exchange Area. Private lands have been subdivided for residential development northwest of the Selected Lands and a large commercial development has recently changed management from an outlet mall to a festival market place. Private lands on the east and south (about 10 miles) are also being developed for residential use. The private lands five miles west of the Tejon Land Grant (southwest of the Selected Lands area) house a large community (Placitas) that is still actively being developed.

County and State Access within the DEIS Proposed Exchange Area. Access to the selected lands is from Interstate 25 (Exit 259) east on County Road 252A (formerly State Road 22). Sandoval County has requested a right-of-way for County Road 252A, which was proposed for consideration under Federal Revised Statue 2477 Right-of-Way. There will be a right-of-way granted to Sandoval County or the New Mexico Highway and Transportation Department after agreement is reached between the County and the Highway Department.

Many of the public lands contain historical access roads that are used by adjacent landowners to access their private lands. In order to identify these roads the BLM requested landowners to mark these roads on a map through a letter dated May 19, 1998 (see Map 3).

Land Uses (Offered Lands)

The Offered Lands are individual sections or group of sections lying within blocks identified as Management Class A lands in the Rio Puerco RMP (see Map 4a-e). Private lands within the Ball Ranch ACEC block as well as other high priority acquisition areas administered by the Taos Field Office especially within or adjacent to Orilla Verde Recreation Area, Burnt Corn Pueblo and La Cieneguilla may also be purchased by the Pueblo for exchange. As stated in the Rio Puerco and Taos RMPs, acquisition of these areas could serve to consolidate public ownership in areas of outstanding recreation, wildlife, riparian, and cultural resources value, improving the management of the land ownership pattern. Lands within WSA's would be managed under Interim Management Policy for Lands Under Wilderness Review (USDI, BLM, 1995). The lands not within WSAs would be managed under the management prescriptions of the ACEC plans and the RMPs.

Consolidating land ownership would result in a more manageable land ownership pattern within the Management Class A lands and high priority acquisition areas.

Wilderness (Selected Lands)

The Selected Lands within this proposed exchange area contain no WSAs or designated wilderness areas.

Wilderness (Offered Lands)

A thorough discussion of the wilderness resources of the Offered Lands can be found in the *BLM New Mexico Statewide Wilderness Study: Final Environmental Impact Statement* (USDI, BLM, 1988a), which lists the Offered Lands within WSAs potentially identified for acquisition.

Recreation (Selected Lands)

Recreational activities in the Selected Lands affected by this DEIS include activities such as hiking, camping, picnicking, wildlife viewing, upland bird hunting, recreational shooting, horseback riding and photography which are dispersed throughout the proposed exchange area. Other recreational activities consist of motorized vehicle and mountain bike use on established roads. Motorized vehicle use within the Selected Lands is limited to existing roads and trails as allocated through the 1986 Rio Puerco RMP (reprinted in 1992 and published in the Federal Register on April 16, 1987). The 7,376 acres of Selected Lands fall within the 22,731-acre Ball Ranch off-road vehicle designation area where this type of use is limited to existing roads and trails.

In recent years, vehicle access has only been possible for about 5,000 of the 7,376 acres of public land proposed for exchange in this DEIS. Largely because of restricted access, recreational use is not considered to be high.

Recreation (Offered Lands)

Offered Lands would most likely provide resources for dispersed recreation activities that would be similar to those on public lands immediately adjacent to the Offered Lands. Currently recreational use on the Offered Lands would be at the discretion of the private land owner. The Offered Lands within WSAs, once transferred, would provide additional opportunities for primitive and unconfined types of recreation activities, similar to those currently provided on adjacent public lands.

Visual Resources (Selected and Offered Lands)

(Note: Ratings from the BLM scenic quality classes, visual sensitivity levels, and distance zones are combined to form Visual Resource Management (VRM) Classes. A VRM class identifies the suggested degree of human modification that should be allowed in a certain landscape.)

BLM's Rio Puerco RMP indicated that the approximately 7,376 acres of Selected Lands within the DEIS study area are classified as VRM Class IV. Because Class IV areas are considered to be of lower value visual quality, management objectives allow contrasts to be the dominant landscape features in the area. Such contrasts might include developments or structures that attract attention in the landscape, such as communication sites, mineral development, or disposal sites. However, every attempt would still be made to minimize modifications to the landscape.

Air Quality (Selected and Offered Lands)

Reduction of air quality impacts from activities on public lands is accomplished by mitigation measures developed on a case-by-case basis through NEPA or other statutory or regulatory processes. Each impact is evaluated to see if it is allowable and acceptable. Activities such as road construction and mining have dust abatement programs as part of their permits or contracts.

The BLM is required to comply with the New Mexico State Implementation Plan on air quality as well as meet responsibilities under the Clean Air Act (as amended) and FLPMA (see Appendix C). BLM 7300 Manual will provide administrative guidance on air resources upon approval.

The affected [proposed] exchange area is designated a Class II airshed under the 1977 Clean Air Act. This airshed meets all New Mexico and Federal air quality standards.

The open landscape in the area makes alteration of its airshed very apparent. Wildfires are the most common source of air-quality deterioration, with some pollution caused by nearby Albuquerque.

Noise (Selected and Offered Lands)

Noise in the proposed land exchange area is generally low and not disturbing. Normal sources of noise include automobiles, wind, animal life, state and county road department equipment, and occasional airplane overflights.

Except those areas that are close to heavily traveled roadways such as Interstate Highway 25 and other county and State roads in the region, day-night weighted sound levels within the affected exchange area probably range from 20 to 25 decibels (dB) on the A-scale dB(A) at midnight to 45 to 50 dB(A) during typical afternoons with moderate wind. (A value of 55 dB(A) is comparable to the noise heard approximately 50 feet from a road carrying light automobile traffic).

Hazardous Materials (Selected Lands)

An Environmental Site Assessment (ESA) was conducted on lands affected by this EIS. They have been examined using the American Society for Testing and Materials (ASTM) protocols Standard Practice for Environmental Site Assessments: Transaction Screen Process (ASTM, 1993), and in accordance with Section 120(h) of the Superfund Amendments and Reauthorization Act (SARA). No evidence exists to indicate that any hazardous material (the term includes hazardous substances, wastes, or other materials) was stored for one year or more, disposed of, or released on the affected land exchange property.

Hazardous Materials (Offered Lands)

Once an equal value for Offered Lands are identified from Maps 4(a-e), a hazardous materials inventory would be conducted. Information from this report could provide the basis for a BLM decision to delete certain parcels from the proposed land exchange.

Cultural Resources (Selected Lands)

A BLM Class I review of existing cultural resources information (Roney, 1996) shows that all of the [proposed] Santo Domingo exchange lands have been inventoried for cultural resources. Results suggest that these Federal lands and their immediate vicinities were used minimally during the PaleoIndian and Archaic Periods. More intensive use occurred during the early part of the Pueblo IV Period (AD 1315 to 1450), when a number of small

field houses were built. Of the 90 houses in this general area that have been formally recorded by archeologists, the largest is four to six rooms in size. Most of the houses are only one or two rooms in size. In historic times, Native American use has been concentrated in the area of present-day Pueblos, although ethnographic evidence shows that tribal members still attach great historical, cultural and traditional significance to the proposed land exchange area.

Approximately one mile of the Camino Real passes through the extreme northwestern corner of the selected lands (Marshall, n.d.). Historic European use in this area has been focused in mining communities on adjacent lands which are now patented. Mining began in the vicinity of Golden, New Mexico, in the early 1600s, and the San Pedro and Ortiz Mountains have been the object of intense, if intermittent, economic interest. On the Selected Lands themselves, ranching has been the predominant economic activity.

Cultural Resources (Offered Lands)

Lands identified for potential transfer to BLM include significant cultural resources. Examples are Burnt Corn Pueblo, a large 13th century ruin in the Galisteo Basin, lands near Santa Fe, NM, which contain significant prehistoric rock art, and a parcel near Cuba, NM, which includes the heart of a 12th and 13th century Anasazi community.

American Indian Uses (Selected Lands)

In 1997, BLM proposed to exchange lands now included in the Santo Domingo /BLM Exchange to the State of New Mexico. In response to this proposal, Santo Domingo Pueblo expressed concerns related to traditional, historical, and cultural access and uses of these lands. One important objective of the exchange proposed here is to give Santo Domingo Pueblo direct control over those lands and traditional uses.

American Indian Uses (Offered Lands)

No specific information is available about American Indian Uses of the lands which BLM might receive under this proposal.

Rangeland Management (Selected and Offered Lands)

Ortiz Mountain Allotment. The Ortiz Mountain Allotment is currently licensed for 2,272 animal unit months (AUMs). There are 15,413 acres of public land in the allotment, and it is 66 percent Federal land. Forty-nine percent of the allotment is in the Santo Domingo Exchange, 22 percent is in the San Felipe Exchange, and 29 percent is being retained in Federal ownership. The allotment is in the "I" (Improve) management category and has been recommended to remain in the I category.

The allotment is used as a cow-calf operation, with grazing occurring year long. Most years, there is some non-use to a varying extent, depending on climate and the livestock market. The current permit was effective 3/1/1993 and expires 2/28/2002. The permitted use is as follows in Table 3-3:

TABLE 3-3

PERMITTED LIVESTOCK USE
(Ortiz Mountain Allotment)

Allotment Name	Period of Use		Livestock Number & Kind	% Federal	AUMs	Suspended	Active
	Beginning	End					
Ortiz Mountains	3/1	2/28	50 C	66	396	0	396
	5/1	10/31	470 C	66	1876	0	1876
				Total	2272	0	2272

Socio-Economic Conditions (Selected and Offered Lands)

For purposes of social and economic analysis, the Selected Lands are primarily in Sandoval County. The balance of the Selected Lands (approximately 18.5 percent) is in Santa Fe County. Because of their proximity to Albuquerque and Santa Fe, two of the State's major population centers, some spillover effects would occur, and Bernalillo County would also be affected. Population, employment income, and surface acreage ownership are presented for these counties. Because the potential offered lands are scattered, small tracts, the change in their ownership is less likely to have measurable social or economic effects. Change of ownership would contribute to manageability and to resource protection for special value resources.

Santo Domingo Tribal Government Offices are located within Sandoval County. The Pueblo, the home of a reservation population of 4,324 tribal members, has 64,401 trust acres in Sandoval and Santa Fe Counties.

Sandoval County's population has grown at a very rapid rate since 1970 (see Table 3-4). The census reported a 1970 population of 17,492; by 1980, the population had increased by 97 percent to 34,400. The rate of increase declined between 1980 and 1990, but the population grew to 63,319. Estimates for July 1, 1998, show Sandoval County with a population of 88,049. The 1970-to-1998 percentage increase was 403.37, compared to a 70.78 percent increase during the same period for the State of New Mexico. Santa Fe County had an increase of 125.26 percent to 123,386, and Bernalillo County had an increase of 66.56 percent to 525,958.

TABLE 3-4

EXCHANGE AREA POPULATION
(By County and Year)

	Year			
County	**1970**	**1980**	**1990**	**1998**
Bernalillo	315,774	420,261	480,577	535,958
Sandoval	17,492	34,400	63,319	88,049
Santa Fe	54,774	75,519	98,928	123,386
Total (New Mexico)	1,017,055	1,303,302	1,515,069	1,736,931

The three countries associated with the exchange area include more than 42 percent of the State’s population. The State population by race includes 86.6 percent White, 2.6 percent Black, 9.4 percent American Indian, and 1.5 percent Asian or Pacific Islander. Ethnicity is estimated at 40.3 percent Hispanic (any race), 48.0 percent White Non-Hispanic and 52.0 percent Non-Anglo (see Table 3-5). Sandoval County, the primary area affected by the exchange, has a race distribution of 75.3 percent White, 2.2 percent Black, 21.1 percent American Indian, and 1.3 percent Asian or Pacific Islander. Ethnicity is estimated at 29.1, Hispanic, 48.4 percent White Non-Hispanic, and 51.6 percent Non-Anglo (see Table 3-6).

TABLE 3-5

EXCHANGE AREA POPULATION
(By Race and Ethnicity; 1998)

	RACE					ETHNICITY	
County	**White**	**Black**	**American Indian**	**Asian & Pacific Islander**	**Total**	**Hispanic (Any Race)**	**White Non Hispanic**
Bernalillo	472,840	20,244	20,003	12,871	**525,958**	206,323	279,882
Sandoval	66,313	1,968	18,601	1,167	**88,049**	25,592	42,599
Santa Fe	117,145	1,223	3,931	1,087	**123,386**	63,173	55,860
New Mexico	1,503,470	45,124	162,686	25,651	**1,736,931**	700,289	834,364

The Tribal Profile (received 2/2/00 from the Southern Pueblo's Agency for the Santo Domingo Pueblo) showed a reservation population of 4,324, which represents approximately 23 percent of Sandoval County's American Indian population and approximately 4.9 percent of the county's total population.

TABLE 3-6

RACE AND ETHNICITY SUMMARY
(By County: in Percent)

	County			
	Bernalillo	**Sandoval**	**Santa Fe**	**New Mexico**
White	89.9	75.3	94.9	86.6
Black	3.8	2.2	1.0	2.6
American Indian	3.8	21.1	3.2	9.4
Asian Islander	2.4	1.3	0.9	1.5
Total	**100.0**	**100.0**	**100.0**	**100.0**
White Non-Hispanic	53.2	48.4	45.3	48.0
Non-Anglo	46.8	51.6	54.7	52.0
Total	**100.0**	**100.0**	**100.0**	**100.0**
Hispanic	39.2	29.1	51.2	40.3

Employment has been high, and unemployment rates have been low for counties in the proposed exchange area. The following information from the Bureau of Business and Economic Research (University of New Mexico, 1998) shows civilian labor force figures for Bernalillo County at 290,610, Sandoval County, 50,506, and Santa Fe County at 64,189. The unemployment rates were 4.4%, 5.2%, and 3.6%, respectively; the employment equals 48.8 percent of New Mexico's (831,052) labor force. Overall, New Mexico has an unemployment rate of 6.6 percent.

The major employment sectors in the proposed exchange area in 1998 were services (33.7%), government (24.7%), and wholesale and retail trade (23.7%). Sandoval County had a higher level of employment in the service sector (42.6%) and less employment in the wholesale and retail trade sector.

Per capita income varied between Sandoval and the other counties. Sandoval County's $18,453 is 95.6 percent of the state's average of $19,298. Bernalillo County is 126.8 percent of the State average and Santa Fe is 131.9 percent. Income earned in the manufacturing sector leads all sectors, accounting for 26 percent of Sandoval County's personal income. Services lead the sectors for earned personal income in Bernalillo and Santa Fe Counties with 27 and 21 percent, respectively.

The exchange area has had a long history of habitation by Native Americans, with a shorter period for Hispanics and an even shorter period for non-Hispanic Whites. Each group holds social and cultural values distinctly its own, but each group has been required to make accommodations for others, resulting in a colorful and diverse social setting. The area's population has had a consistent and substantial growth over the last few decades, with some shifts between the rural and urban areas.

The Albuquerque/Rio Rancho area has had rapid and consistent growth and is a service center to much of New Mexico. The resources of the exchange area, especially the Selected Lands, in close proximity to the large population center, have been used for recreation and open space.

Attitudes expressed by groups and individuals involved in the exchange process are diverse and relate for the most part to either their social and/or cultural values. Those who have used the land for their own recreational purposes recognize that they will no longer have the access to the lands that they have had under public ownership, and, while there would be other public lands received, these lands will not be as convenient to use.

Under the proposed exchange, the Pueblo people would have jurisdiction over lands that will allow them to control the use of areas of high traditional cultural value (see Table 3-7 for data on surface land ownership). In these situations, it is not likely that everyone will be satisfied with their decisions.

TABLE 3-7

SURFACE LAND OWNERSHIP BY COUNTY
(Acres)

County	All Federal	BLM	Tribal	Private	State	Total
Bernalillo	119,243	10,922	226,140	370,216	28,732	744,331
Sandoval	958,023	534,351	735,297	589,357	78,146	2,360,823
Santa Fe	327,698	74,233	84,925	720,230	81,681	1,214,534
Subtotal	1,285,721	608,584	820,222	1,309,587	159,827	3,575,357
Percent of Total	35.96	17.02	22.94	36.63	4.47	100.00

TABLE 3-8

PERSONAL INCOME
(By Major Source and Earnings and by Industry, 1997; in thousands of dollars)

Item	County			
	Bernalillo	Sandoval	Santa Fe	New Mexico
Income by Place of Residence				
Personal income	12,865,431	1,584,414	3,094,758	33,268,754
Nonfarm personal income	12,860,064	1,577,962	3,090,884	32,889,302
Farm income	5,367	6,452	3,874	379,452
Per capita personal income ($)	24,478	18,453	25,453	19,298
Derivation of Total Personal Income				
Earnings by place of work	10,220,252	819,220	1,914,128	23,007,975
less: personal contribution for social insurance	779,390	65,054	148,623	1,758,332
plus: Adjustment for residence	-875,421	388,957	175,006	72,697
equals: net earning by place of residence	8,565,441	1,143,123	1,940,511	21,322,340
plus: Dividends, interest, and rent	2,100,532	172,000	775,091	5,242,531
plus: Transfer payments	2,199,458	269,291	379,156	6,703,883
Earning By Place of Work				
Components of Earnings:				
Wage and salary disbursements	8,622,539	667,469	1,440,053	18,654,508
Other labor income	845,543	77,877	136,518	1,885,954
Proprietor's income	752,170	73,874	337,557	2,467,513
Farm proprietors	1,898	4,156	2,359	223,657
Nonfarm proprietor's	750,272	69,718	335,198	2,243,856
Earnings by Industry:				
Farm earnings	5,367	6,452	3,874	379,452
Nonfarm earnings	10,214,885	812,768	1,910,254	22,628,523
Private earnings	8,155,285	726,752	1,445,021	16,896,741
Ag.ser.forestry, fishing and other	49,871	3,484	11,894	161,424
Mining	29,453	1,103	13,379	820,183
Construction	733,715	72,999	152,939	1,618,325
Manufacturing	857,601	415,482	78,378	1,856,475
Transportation & Public utilities	570,148	15,556	42,507	1,365,762
Wholesale trade	636,766	13,602	51,066	974,177
Retail trade	1,102,823	73,277	276,071	2,590,123
Finance, insurance & real estate	647,812	22,045	172,151	1,164,347
Services	3,527,096	109,204	646+,636	6,345,925
Government & government enterprizes	2,059,600	86,016	465,233	5,731,782

CHAPTER 4

ENVIRONMENTAL CONSEQUENCES

INTRODUCTION

The environmental consequences of implementing each alternative are considered for the "selected" and, to the extent possible, the "offered" lands. Only elements believed to be impacted by the actions required to implement the alternatives are given detailed consideration. Preliminary analysis indicates that climate, transportation, topography and prime and unique farmland do not require detailed analysis.

GENERAL ASSUMPTIONS AND GUIDELINES

l. Changes or impacts described and analyzed are short term (within a five-year period) unless otherwise stated; long-term impacts would occur 5-years and over.

2. The management actions were analyzed under the assumption that all actions would be fully implemented after the [proposed] land exchange occurred. The analysis also assumes that the conservation easement on the Selected Lands will be managed by the BIA and the lands would eventually become Trust lands managed by the BIA for the benefit of the Santo Domingo Pueblo. (see Glossary, Appendix F). It was also assumed that the Offered Lands to be acquired by the BLM under this proposal would provide BLM improved manageability and accessibility to these lands.

3. In addition, it was assumed that adequate funding and manpower would be available to implement the management actions discussed in the Proposed Action Alternative and Alternative B.

LAWS AND EXPLANATION OF PROPOSED LAND EXCHANGE PROCESS

As described in detail in Chapter Two under the Proposed Action Alternative, the conveyed BLM lands would become Fee lands (see Appendix F) and eventually Indian Trust Lands to be managed by the BIA. While the lands are currently managed by the BLM as part of their mission (see Appendix A) and under the principles of multiple use and sustained yield for the benefit of the public, the Santo Domingo Pueblo and the BIA would manage the lands for the benefit of the Pueblo.

The Selected Lands area is currently managed by the BLM under a number of Federal laws that would continue to be in effect if the proposed exchange is implemented. Many of these laws are concerned with environmental protection. Among these are the National Environmental Policy Act (NEPA) of 1976, Theft of Government Property statutes, the Endangered Species Act of 1973, the Archeological Resources Protection Act (ARPA) of 1979, the American Indian Religious Freedom Act of 1978, the Antiquities Act of 1906, and the National Historic Preservation Act (NHPA) of 1966. Stringent Federal mandates, including the Federal Land Policy and Management Act (FLPMA) of 1976 would also apply to the offered lands if they were acquired through the proposed exchange. (See Appendix C for a detailed description of these laws.)

The proposed exchange would consolidate ownership of public lands in high priority acquisition areas. In addition, by reducing mixed BLM ownership, the exchange would result in an improved land ownership pattern within the Albuquerque Field Office and the Taos Field Office.

Acquiring the Offered Lands within high priority acquisition areas is a primary goal of the Rio Puerco and Taos RMPs (DOI, 1988 and 1988b). These acquisitions would improve the manageability of these areas and their associated resources. As mentioned earlier, completing the proposed exchange would also enhance BLM's land ownership consolidation goals by improving access and improving the manageability of these lands.

DETAILED IMPACT ANALYSIS BY RESOURCE

In the following impact analysis, individual resources described in Chapter Three (Affected Environment) are discussed, with impacts to both Selected and Offered Lands affected by this proposed exchange.

Impacts to Ecological Sites/Vegetation (Selected and Offered Lands)

As a result of the conservation easement and the Pueblos's commitment not to develop these lands, vegetative and ecological site impacts would not occur except for the 1,300 acres that would probably be mined for sand and gravel. Over an extended period these 1,300 acres would be completely stripped of vegetation and associated ecological sites. Current gravel mining practices include removal and storage of topsoil to be replaced and reseeded as part of site reclamation, so in the long term the ecological sites and vegetation in the mined area will be returned to an approximation of those currently existing.

Relevant regulations and policies from various BLM programs would guide the activities occurring on the Offered Lands with the ecological site/vegetation remaining essentially as they are.

Impacts to Threatened, Endangered and other Special Status Species (Selected and Offered Lands)

A Biological Assessment was prepared on the proposed action for all listed, proposed and candidate species that could potentially occur within the Santo Domingo land exchange area (Refer to Appendix D). The determination of the Biological Assessment was that the proposed action would have a "No Effect" on all listed, proposed and candidate species due to lack of appropriate habitat to support any of the species within the proposed exchange area.

Because a finding of "No effect" was identified for all species involved, no formal concurrence on the determinations was requested from the U.S. Fish and Wildlife Service.

When the offered parcels become BLM lands, they will be treated as other public lands and all requirements of the Endangered Species Act will be followed.

Impacts to Water Resources (Selected and Offered Lands)

The Santo Domingo Pueblo has indicated it will mine sand and gravel in Section 25, and those portions of Sections 26 and 35 within the exchange area. This could have an effect on Arroyo Largo and other drainage depending on how close to the channel or groundwater mining is permitted and the array of Best Management Practices implemented. Modern gravel operations typically remove the upper soil material and stockpile it for use in rehabilitation. Then gravel-bearing material is removed for screening, crushing, stockpiling and hauling to a job site. Rehabilitation is a continuous process as waste material is placed back in the excavation areas, contoured and vegetation is re-established.

Generally, the potential impacts from a sand and gravel mine include visual and physical alterations of the topography, loss of vegetation and topsoil, increased sediment yields, alteration of hydrologic functions, contamination of both surface and ground water from petroleum product spills, noise, and dust. Another impact is the use of water for processing the material, dust abatement in the pit and on roads, and for drinking water. Under Proposed Action gravel would be mined within a 1,300 acre area. Based on water usage of 5 gallons per ton of material processed in local gravel operations and a reasonable development of about 266,500 tons per year, the proposed mine will need water rights for 5 acre feet of water per year.

With an aggressive modern nonpoint source pollution management effort, the potential for water quality impacts to surface and ground waters in Arroyo Largo and possibly Gallisteo Creek and the Rio Grande would be reduced to a minimum.

In the remainder of the proposed exchange area, the Santo Domingo Pueblo has given no indication of plans to make any changes in the landscape. There is no reason to expect impacts to soil or water resources in these areas as result of this exchange.

Under New Mexico water law, an appropriation water right is considered property and can be owned separately from the land it comes from or the land it is used upon. On BLM lands the water rights and land are separated by ownership. The appropriator owns only the right to use the water and not the water itself. There are conditions of amount, location, and time of use attached to the right. The right can be sold, traded, or transferred with approval of the Office of the State Engineer, and therefore has a market value. In the proposed exchange the private water rights on BLM land can be sold or traded on the open market, or transferred to another location. If the rights are transferred to another location the State Engineer may require that the abandoned well be plugged. The owners of these water rights will decide their disposition.

Impacts to Wildlife (Selected Lands)

Under the Proposed Alternative, wildlife on the Selected Lands would no longer be managed under the guidelines of the Rio Puerco RMP (DOI, 1986); however, eventually decisions affecting wildlife would continue to be subject to NEPA regulations since this law would still apply under BIA's management. Hunting would probably be eliminated except for Pueblo members once the Pueblo or BIA assumed management of these lands.

Impacts to Wildlife (Offered Lands)

Wildlife on the Offered Lands would be managed according to the guidelines established by the Rio Puerco and Taos RMPs (DOI, 1986 and 1988a). Specifically, BLM's management would seek wildlife resources improvement or protection and would coordinate any actions to best suit the resources and uses of each area. Under BLM's laws for wildlife, management objectives for wildlife are to maintain habitat diversity, sustain ecosystem integrity, enhance aesthetic values, preserve the natural environment, and provide old growth habitat. These objectives would be accomplished somewhat through habitat manipulation such as mechanical thinning, prescribed fire, fencing and to a greater extent through mitigation established under NEPA.

Where the Offered Lands are within the boundaries of an ACEC, wildlife resources would be subject to the more detailed specifications of existing ACEC plans. Such plans may provide a higher level of management and protection not presently exercised on the Offered Lands.

When acquired by BLM under the proposed plan, all Offered Lands would become subject to regulations under NEPA. Routine NEPA analysis is designed to provide greater detail regarding management actions than is currently required on private lands. NEPA also provides the BLM with the opportunity to coordinate and mitigate land use for the benefit of wildlife resources.

Impacts to Geology & Paleontology (Selected Lands)

No impacts to the geology of the Selected Lands would occur under the Proposed Action Alternative. Any known unique geological features present on the selected land area would be maintained under the Santo Domingo Pueblo ownership.

Extensive deposits of finely-preserved petrified wood, bivalve marine shells, and Eocene mammal bones exist within this nearby Ball Ranch ACEC; however, the coarse-grained deposits outside of the ACEC area are unlikely to contain well-preserved vertebrate fossil material.

Impacts to Geology & Paleontology (Offered Lands)

Several of the Offered Lands parcels identified contain paleontological resources that would be placed under Federal protection if the proposed exchange would occur.

Impacts to Mineral Resources (Selected Lands)

A Mineral Report was prepared on December 2, 1999, which provides detailed information concerning the mineral potential of the Selected Lands area proposed to be exchanged. The report indicates that sand and gravel is the only mineral commodity that would be developed in the reasonable foreseeable future. If the land exchange were to occur, the Santo Domingo Pueblo would be able to issue mineral leases on the Selected Lands area for tribal economic purposes.

Impacts to mineral resources as a result of the proposed exchange would stem from the U.S. Government and the American public not receiving the royalty benefits. These benefits could have been generated from mining almost 160 million cubic yards of sand and gravel resources in the Selected Lands area over time. However, due to the limits of recovering the resources at a profit, as well as traditional and cultural conflicts present in this area, it would have been highly unlikely that all this material would ever be mined by either BLM or the Santo Domingo Pueblo.

The Mineral Report further indicates that it is reasonably foreseeable that up to three mines could be producing 1.2 to 1.5 million cubic yards of sand and gravel per year to supply the expanding nearby Albuquerque, Santa Fe, and Rio Rancho markets. Several of the larger mineral material operators are reaching the extent of their reserves and are currently looking for additional resources. Local companies have contacted BLM about their desire to produce this sand and gravel resource from public lands in the selected land area. (However, these companies have

been denied their requests to mine since discussions began concerning the possibility of a land exchange on the Selected Lands area.)

In summary, the Santo Domingo Pueblo would receive economic benefits (via the BIA) from any mineral royalties derived from lands acquired as a result of the proposed land exchange, and the Federal government would not benefit from any of these royalties.

Impacts to Mineral Resources (Offered Lands)

Most of the Offered Lands that BLM would acquire as a result of this proposed land exchange would probably be incorporated into specially designated lands, such as an ACEC or SMA. Consequently, no surface disturbance, including mining, could occur on these lands. Lands not within these areas would be subject to available resource development and federal regulations.

Impacts to Land Uses (Selected Lands)

The Selected Lands affected by this proposed land exchange contain three historical access roads that are used by adjacent landowners to reach their private lands and an access road used to reach state lands. Through a letter to these landowners dated May 19, 1998, and at a subsequent meeting, the BLM requested landowners to mark these roads on a map to aid in mitigating landowner concerns about access (see Map 3). Landowner access would be established between individual landowners and the Pueblo. If agreement could not be reached BLM would issue rights-of-way for the historical road prior to completing the exchange. The patent would be subject to the right-of-way.

In addition to the private landowners' and the States' concerns over access, Sandoval County has requested a right-of-way for County Road 252A (formerly State Road 22), which was proposed for consideration under Revised Federal Statute 2477 right-of-way. Sandoval County would be a right-of-way before the proposed exchange would be completed.

Also, the Public Service Company of New Mexico would need to negotiate directly with the Santo Domingo Pueblo instead of the BLM to obtain new rights-of-way after the proposed exchange is in effect. The Pueblo would likely have different requirements for right-of-way corridors than currently exist on public land. The two powerline rights-of-way currently within the existing designated corridor will be reserved in the patent and would continue to be managed by the BLM. The remaining powerline will be made subject to that right on the patent.

If the New Mexico Highway Department's study is concluded with an application for a right-of-way for the current County Road 252A a right-of-way will be considered after agreement between the NM Highway Department and the County.

Further impacts to current land uses as a result of the proposed land exchange would be that: State and county highway departments may not be able to obtain additional, needed rights-of-way for new roads. Additionally, the opportunity for state and local governments and non-profit organizations to obtain public lands through the Recreation and Public Purposes Act (R&PP; see Appendix C) at less than fair market value would be eliminated.

Impacts to Land Uses (Offered Lands)

New ROW activities would be restricted on the lands lying within areas specially designated for environmental and resources protection. New ROWs in areas outside the designated areas will be considered subject to NEPA laws (see Appendix C and the Rio Puerco and Taos RMP's). Existing authorized uses on the offered lands would be protected, such as current Federal mineral leases and existing ROWs. Current ROW holders would be contacted and informed of the change of land ownership, and they would be encouraged to obtain new authorization from BLM.

In some cases under the proposed exchange, State and county-maintained public roads and highways cross portions of the offered lands, providing access routes for the general public to outlying areas. However, due to the remote nature of many of these lands, these occurrences would be minimal.

Land acquired within a withdrawal area will be subject to the terms and conditions of that withdrawal.

Impacts to Wilderness (Selected Lands)

Under the proposed alternative, no impacts would occur to wilderness on the affected Selected Lands, as none of these lands are within or adjacent to designated wilderness areas or WSAs.

Impacts to Wilderness (Offered Lands)

Acquiring the private inholdings and lands adjacent to WSAs would greatly enhance wilderness values and improve the BLM's ability to manage these areas to maintain their primitive nature.

Impacts to Recreation (Selected Lands)

As indicated in the Recreation section of Chapter Three, the use of these lands for recreational purposes has not been extremely high because of public access problems. However, the proposed transfer of the Selected Lands to the Santo Domingo Pueblo would likely eliminate the public's opportunities for motorized recreational access to 5,000 acres presently accessible by motor vehicle and mountain bikes and access to the total 7,376 acres presently available to non-motorized recreational activities. Noncommercial, noncompetitive and non-organized recreational activities on Federal lands are currently available to the public at no cost. Should the Santo Domingo Pueblo allow limited recreational access, a fee would most likely be charged.

Impacts to Recreation (Offered Lands)

Under the proposed action, the transfer of the Offered Lands to the BLM would add to the public recreation opportunities in those areas. Recreational use on any lands transferred to the BLM would become subject to the Federal rules and regulation governing the recreational use and occupancy of public lands, areas, sites, and facilities. When Offered Lands within the boundaries of an ACEC or WSA are transferred to BLM, recreational use would become subject to management prescriptions and policies established to protect the specific values found in these areas.

Impacts to Visual Resources (Selected Lands)

Under the proposed alternative, the overall impacts to visual resources on the Selected Lands would be reduced as a result of a conservation easement placed on the selected lands except for 1,300 acres within Sections 25, 26, and 35, T. 14 N., R. 6 E., NMPM (see Map 3). Provisions within the easement were established by BLM to preserve these substantial, undisturbed selected lands in their natural state. Within the excepted lands, the construction or placement of buildings and other structures would be permissible as well as the extraction of sand, gravel, rock or other material on or below the surface.

The 7,376 acres of Selected Lands are classified in the Rio Puerco RMP (DOI, 1986) as BLM Visual Resource Management Class IV, a class that is considered to be of lower scenic quality and which allows for evident contrasts to the basic landscape elements as a result of management activities. If the Selected Lands were transferred under the Proposed Alternative to the Santo Domingo Pueblo, visual resource management objectives established by the BLM through its classification system would then of course no longer apply. As a result of this proposed transfer, a loss of 7,376 acres of VRM Class IV lands would occur within the administrative boundaries of the BLM's Albuquerque Field Office.

Also (if this alternative were chosen), the public would not be assured that attempts to minimize visual impacts from extractive uses and placement of structures on the excepted lands within the Selected Lands would occur. If not effectively controlled, impacts to the visual resources could be substantial if a high degree of human modification occurred to the [presently] relatively undisturbed landscape.

Impacts to Visual Resources (Offered Lands)

Acquisition of the Offered Lands would give the BLM the authority to manage the visual resources of those lands. Most of the lands are located in or adjacent to existing special management areas classified as VRM Class II, which does not allow changes to the landscape that would attract attention. Acquisition of these lands would assist in maintaining the visual quality of those areas.

Impacts to Air Quality and Noise (Selected and Offered Lands)

Sand and gravel mining would likely take place in the selected lands. Air quality would decrease as levels of air-borne particulate matter increase. It is expected that mitigation measures would be used to lower the level of

particulate matter. Noise levels would increase in the mining area as a result of heavy equipment operating. These noises would be concentrated near the mine and there are no residential areas near the likely mined area, therefore, the impacts to human environment would be low.

Impacts to Hazardous Materials (Selected Lands)

An Environmental Site Assessment (ESA) was conducted on all lands affected by this EIS. They have been examined using the American Society for Testing and Materials (ASTM) protocols Standard Practice for Environmental Site Assessments: Transaction Screen Process) ASTM, 1993), and in accordance with Section 120(h) of the Superfund Amendments and Reauthorization Act (SARA). No evidence exists to indicate that any hazardous material (the term includes hazardous substances, wastes, or other materials) was stored for one year or more, disposed of, or released on the affected land exchange property.

If during gravel mining, there is a petroleum product related spill, the company would be required to clean up the spill to meet the requirements of the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA), and the Environmental Protection Agency (EPA) who has jurisdiction over environmental matters on tribal lands.

Impacts to Hazardous Materials (Offered Lands)

If the proposed alternative is chosen and once lands are identified (see Maps 4(a-e)), a hazardous materials survey would be conducted on the Offered Lands. Information from this survey report would provide the basis for a BLM decision to delete certain parcels from the proposed exchange (if hazardous materials were found), thus, there would be no impacts regarding hazardous material management [on the offered lands portion].

Impacts to Cultural Resources (Selected Lands)

It is anticipated that all of the lands acquired by Santo Domingo Pueblo as a result of this action will be placed in Trust and managed by the BIA. Any cultural resources located on these lands would remain under the protection of the National Historic Preservation Act, the Archeological Resources Protection Act, and other Federal laws pertaining to cultural resources (see Appendix C). The BIA and the Pueblo would be obligated to provide the same level of protection to archeological and historic properties that they now receive under BLM management. Under the proposed action, there would be a brief interval during which the Pueblo would own the lands in fee simple (see Appendix F). A patent reservation (see Appendix F) would ensure legal protection of cultural resources during this period.

Impacts to Cultural Resources (Offered Lands)

Cultural resources on lands which might be transferred to BLM through this proposed land exchange are currently privately owned. New Mexico state law prohibits the excavation of human burials except under carefully controlled circumstances, but otherwise treatment of cultural resources on private lands is entirely at the owner's discretion. Any cultural resources transferred to BLM under this proposed alternative would become subject to Federal laws protecting the resources from vandalism and inadvertent destruction.

Impacts to American Indian Uses (Selected Lands)

Under the Proposed Alternative, if lands currently administered by BLM are transferred to the Santo Domingo Pueblo and held in trust by the BIA, then American Indian (Pueblo) traditional, historical, and cultural access and uses would be aided by the Pueblo tribal government's direct supervision. In addition, the privacy often required for these uses by the Pueblo would be greatly enhanced.

Impacts to American Indian Uses (Offered Lands)

Under the proposed action alternative, lands which are currently privately owned would become public lands. In most cases, this [proposed change of ownership] would enhance American Indian access for traditional, historical and cultural uses. However, privacy required for those uses by the Pueblo could be reduced.

Impacts to Rangeland Management (Selected Lands)

Under the Proposed Alternative, the grazing permittees within the proposed Selected Lands area would be negatively effected by losing most of their grazing privileges, unless they could negotiate an agreement with the Santo Domingo Pueblo. The operator would retain public land grazing privileges (within the Ball Ranch ACEC),

amounting to about 30 percent of that operator's original allotment. [If the proposed exchange were to occur] and after it is in effect, a short grace period could occur, allowing livestock operator to finish the current year's grazing season so that they could then find other lands to graze their livestock on.

Under the Proposed Alternative, no impacts to livestock grazing would occur on the selected lands except for the economic impacts outlined in Table 4-1, which lists the number of livestock currently permitted for allotment on the Selected Lands area and the number of livestock that would be maintained if the land exchange were to occur (based on BLM case files). These numbers, include the livestock permitted on the combined Federal, state and private lands. Approximately seven acres of land are required for forage of each livestock animal per month. As shown, the permittees will experience significant changes in his allotment if the land exchange occurs.

TABLE 4-1

**ANIMAL UNIT MONTHS (AUM's) PERMITTED -
CURRENT ALLOTMENT & AFTER PROPOSED EXCHANGE**

Allotment Name/ #	Current Allotment	After Proposed Santo Domingo Exchange	After Proposed San Felipe & Santo Domingo Exchanges
Ortiz Mountain/118	3,396	2,319	1,773

Allottees having Section 4 Permits under the Taylor Grazing Act (see Appendix C) have the option of salvaging range improvements, such as windmills, drinking troughs, fencing materials, etc., or requesting that BLM compensate them for the value of these improvements. Allottees having cooperative agreements with the BLM would not recoup the salvage value or the labor they have invested in range improvements.

Impacts to Rangeland Management (Offered Lands)

Under the proposed action, any lands acquired by BLM within an existing grazing allotment would be incorporated into the allotment. Lands outside existing allotments would have to be dealt with on a site specific basis. Adjacent land owners with base property could make application to graze these lands. Applications must meet the qualifications specified in 43 CFR 4110. BLM would make a decision on competing applications based on the factors found in 43 CFR 4130.1-2. BLM must also comply with NEPA by analyzing the site specific impacts of grazing before issuing a permit.

Under the proposed action, the grazing permittee would benefit from the BLM's range improvement fund, which makes funds collected from grazing fees available for range improvements. In addition, the BLM has provisions for refunding grazing fees and for taking fee-free non-use of an allotment if approved by the authorized officer.

Impacts to Socio-Economic Conditions (Selected Lands)

The terms of the proposed exchange, which are intended to minimize the environmental impacts that are created, also require that BLM receive title to lands in areas identified in BLM's planning areas with special resources values in exchange for the Selected Lands. Under the proposed action, the Pueblo will accept a conservation easement on the Selected Lands from BLM which excludes surface-disturbing activities or development but does allow for grazing and traditional cultural practices to continue.

The Pueblo essentially would have uninterrupted use of the land for traditional cultural practices. Grazing would continue, but the tribe would issue the permits [instead of BLM], and they may restrict use strictly to the tribe or its members. If the Pueblo agrees, the current BLM permittee holder would likely continue to run livestock, but they would have to compete for private or state land grazing. Having to compete for other grazing rights would be socially disruptive to those who have operated the same allotments for many years.

In addition, the public who currently use the selected lands for recreational and open space uses will have to find other areas to use, areas that probably would be less convenient.

Sandoval County would receive less income from in-lieu-of-tax payments. Based on the payment received per entitlement acre for 1999 this reduction would be approximately $11,000. This amount is less than 1 percent of the County's recent budget. The non-development commitment under the conservation easement would not allow

surface disturbing development on most of the selected acreage. Thirteen hundred acres of the selected lands were not covered by the easement and it is the Pueblo's intent to develop mineral materials on these lands. It would be a positive long-term impact resulting in the creation of jobs and income over many years. Sandoval County's 1998 employment estimates show mining accounting for less than 1 percent of the County jobs and personal income. There were 76 mining jobs, by place of employment, for 1998. The Pueblo's potential mining operation would double that number in direct employment impacts. The indirect effects would be expected to approximately double it again. This total change would be approximately .7 percent of the 1998 Sandoval County non-farm wage and salary employment.

Impacts to Socio-Economic Conditions (Offered Lands)

Under the proposed alternative, in-lieu-of-tax payments would likely replace the payments lost for the Selected Lands. They may not be paid to the same counties.

IMPACTS OF ALTERNATIVE B (NO CONSERVATION EASEMENT)

Impacts to Ecological Sites/Vegetation (Selected and Offered Lands)

After transfer to the Santo Domingo Pueblo, the Selected Lands area would be administered under the laws and policies pertinent to the Pueblo. Therefore, it is assumed that the pueblo would develop approximately 2,600 acres for sand and gravel mining and 1,500 acres for residential/businesses as described in Chapter 2. This would result in a larger conversion of the area's ecological sites and vegetation to those typical of a gravel pit or suburban development area. Gravel mining impacts would likely be the same, for an additional 1,300 acres, as those for the proposed action. Suburban development impacts could incude: pavement for roads, and parking lots; denudation of native vegetation surrounding buildings and houses; fences; and replacement of native vegetation with exotic "garden" types of plants.

Relevant regulations and policies from various BLM programs would guide the activities occurring on the Offered Lands with the ecological sites/vegetation remaining essentially as they are.

Impacts to Threatened, Endangered and other Special Status Species (Selected and Offered Lands)

Impacts to the Selected Lands would be the same as those described under the Proposed Action Alternative.

Impacts to Water Resources (Selected Lands)

For most of the exchange area the impacts would be similar as under Alternative A. The exception would be as the number of acres mined and tons of gravel produced is doubled we can expect the impacts to ground water usage to double. Additional water rights would be required for approximately 10 acre feet per year. The withdrawal of 10 acre feet per year may impact adjacent wells. A separate study would be needed to make that determination. In addition, this alternative proposes to develop 1,500 acres as residential/business along County Road 252A (formerly State Road 22). A planned development of this size and remote from any existing would probably develop its own water and sewer utility system. Assuming a development with between 150 to 300 families the amount of water required would range between 33 to 67 acre feet a year. Water rights would need to be established. There would be increased soil erosion and runoff from construction activities and new roads. The sediment and runoff can be controlled and would be reduced as construction ends and landscaping takes effect.

Impacts to Wildlife (Selected Lands)

Lands allocated to Pueblo residential and or commercial/business use would have a significantly different wildlife community. The pre-exchange amphibian, mammal, and reptile species will be displaced by buildings, parking sites and streets. The species present will depend on the degree of landscaping done around Pueblo homes and commercial/business development.

Typical suburban, commercial/business tree and shrub landscaping will make a predominately bird and possibly bat dominated animal community. Depending on the density of housing, there would be some recolonization by the more habitat flexible small mammals and reptiles.

Impacts to Wildlife (Offered Lands)

Impacts to the Offered Lands would be the same as those described under the Proposed Action Alternative.

Impacts to Geology & Paleontology (Selected Lands)

Impacts to the Selected Lands would be the same as those described under the Proposed Action Alternative.

Impacts to Geology & Paleontology (Offered Lands)

Impacts to the Offered Lands would be the same as those described under the Proposed Action Alternative.

Impacts to Mineral Resources (Selected Lands)

Under this alternative approximately 2,600 acres are assumed to be available for mining sand and gravel so the production would be much greater depending on the demand.

Impacts to Mineral Resources (Offered Lands)

Impacts to the Offered Lands would be the same as those described under the Proposed Action Alternative.

Impacts to Land Uses (Selected Lands)

Under Alternative B, there would be no legal restrictions on future development, therefore, it is likely that land uses in the long term would be development of an additional 1,300 acres for sand and gravel and 1,500 acres for Pueblo residential\businesses. Access for this development would be from County Road 252A (formerly State Road 22).

Impacts to Land Uses (Offered Lands)

Impacts to the Offered Lands would be the same as those described under the Proposed Action Alternative.

Impacts to Wilderness (Selected Lands)

Under this proposed alternative, no impacts would occur to wilderness values on the affected Selected Lands, as none of these lands are within or adjacent to designated wilderness areas or WSAs.

Impacts to Wilderness (Offered Lands)

Acquiring private inholdings and lands adjacent to WSAs and wilderness areas would greatly enhance wilderness values, e.g., naturalness and the opportunity to participate in an unconfined type of recreation activity over a larger area, and improve the BLM's ability to manage these areas to maintain their primitive nature.

Impacts to Recreation (Selected Lands)

As indicated in the Recreation section of Chapter Three, the use of these lands for recreational purposes has not been extremely high because of public access problems. However, the proposed transfer of the Selected Lands to the Santo Domingo Pueblo would likely eliminate the public's opportunity for motorized recreational access to 5,000 acres presently accessible by motor vehicle and mountain bikes and access to the total 7,376 acres presently available for dispersed non-motorized recreational activities. Noncommercial, noncompetitive and non-organized recreational activities are currently available to the public at no cost.

Should the Santo Domingo Pueblo allow recreational access to the acquired lands that would not be encumbered by development or the extraction of sand, gravel or rock (3,276 acres), the users would likely be subject to specific terms and conditions set by the Pueblo for use of these lands, which could include a fee.

Impacts to Recreation (Offered Lands)

Under this alternative, the transfer of the Offered Lands to the BLM would add to the public recreation opportunities in those areas. Recreational use on any lands transferred to the BLM would become subject

to the Federal rules and regulations governing the recreational use and occupancy of public lands, areas, sites and facilities.

Impacts to Visual Resources (Selected Lands)

The 7,376 acres of selected lands are classified in the Rio Puerco RMP as BLM Visual Resource Management Class IV, a class that is considered to be of lower scenic quality and which allows for evident contrasts to the basic landscape elements as a result of management activities. If the Selected Lands were transferred under this alternative to the Santo Domingo Pueblo, visual resource objectives established by the BLM through the classification system would no longer apply. As a result of this proposed transfer, a loss of 7,376 acres of VRM Class IV lands would occur within the administrative boundaries of the BLM's Albuquerque Field Office.

The public would not be assured that attempts to minimize visual impacts from extractive mineral uses and the placement of structures from residential or business/commercial developments within the 4,100 acres assumed to be available for these types of uses would occur. If not effectively controlled impacts from the development to the visual resources could be substantial, dominate the presently undisturbed landscape.

Impacts to Visual Resources (Offered Lands)

Acquisition of the Offered Lands would offset the loss of Class IV lands with the gain of lands considered to have higher scenic quality values. Most of the lands are located in or adjacent to existing special management areas classified as VRM Class II, which does not allow changes to the landscape that would attract attention. Acquisition of the Offered Lands would also assist in maintaining the visual quality of these areas over the long-term by providing control of surface modifications.

Impacts to Air Quality and Noise (Selected and Offered Lands)

Sand and gravel mining would likely take place in the selected lands. Air quality would decrease as levels of air-borne particulate matter increased. It is expected that the level of air-borne particulate matter would be decreased through the implementation of mitigative measures.

Noise levels would increase in the mining area as a result of heavy equipment operating. These noises would be concentrated near the mine and there are no residential areas near the likely mined area, therefore, the impacts to human environment would be low.

Impacts to Hazardous Materials (Selected and Offered Lands)

Impacts to the Selected and Offered Lands would be the same as those described under the Proposed Action Alternative.

If during gravel mining, there is a petroleum product related spill, the company would be required to clean up the spill to meet the requirements of the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA). And the Environmental Protection Agency (EPA) who has jurisdiction over environmental matters on tribal lands.

Impacts to Cultural Resources (Selected Lands)

Transfer of lands to Santo Domingo Pueblo without a conservation easement would not affect treatment of cultural resources. Under this alternative, the patent reservation requiring protection of historic properties on lands in fee status would remain in effect. For lands transferred to trust status, the BIA would assume the same responsibilities under Federal law which the BLM now exercises.

Impacts to Cultural Resources (Offered Lands)

Impacts to Offered Lands under Alternative B are the same as under the Proposed Action.

Impacts to American Indian Uses (Selected Lands)

Alternative B assumes that some development would occur on the Selected Lands, but that the development would avoid direct impacts to American Indian uses. However, development could result in secondary impacts. Noise, dust, and increased traffic associated with expanded mineral development could intrude upon traditional

activities. Real estate development would dramatically increase the numbers of people in the area. This would reduce privacy which is required for many traditional activities and could result in serious trespass issues.

Impacts to American Indian Uses (Offered Lands)

Impacts to Offered Lands under Alternative B are the same as under the Proposed Action Alternative.

Impacts to Rangeland Management (Selected Lands)

Approximately 234 AUMs would be foregone under this alternative in the long term.

Impacts to Rangeland Management (Offered Lands)

Impacts to Offered Lands for rangeland management under Alternative B would be the same as for the proposed action.

Impacts to Socio-Economic Conditions (Selected and Offered Lands)

The economic impacts for this alternative for sand and gravel mining would be similar to the impacts of the proposed action alternative. The magnitude of the impacts would be increased because additional acres would be available for development and it is expected that more than one operation would be developed. Two operations would be expected to add an additional 70+ employees. With the indirect employment the total increase in employment would approach 300 jobs under this alternative. Construction employment would increase related to the residential and business construction. There is no specific plan for this development at this time therefore it is assumed that it would occur gradually over a ten to fifteen year period and that the direct jobs would not exceed 100 in any given year.

IMPACTS OF THE NO ACTION ALTERNATIVE (SELECTED AND OFFERED LANDS)

The No Action Alternative would have no effect on any Federal or state grazing leases, oil and gas leases, or rights-of-way, since administrative jurisdiction currently in place would remain the same. The status of the affected selected land area would remain unchanged.

Under the No Action Alternative, the offered lands [identified for exchange under the Proposed Action Alternative] would not be acquired and the existing mixed land ownership pattern with offered land sections intermingled within blocks of public land, would continue. These lands would not become BLM lands within or adjacent to designated areas or high priority acquisition area. Therefore, the opportunities to enhance management of these areas through consolidation would be foregone. Additional opportunities to protect primitive recreational opportunities, wildlife, scenic and wilderness values, and cultural resources under Federal law would also be foregone.

Listed in the following section are more specific impacts related to the No Action Alternative which apply to both the selected land area and offered lands that the BLM would acquire from exchange with the state.

Impacts to Ecological Sites/Vegetation

The ecological sites and vegetative resources within the proposed exchange area would remain unaffected under the No Action Alternative. Relevant regulations and policies from various BLM programs would continue to guide the activities with the ecological sites/vegetation remaining essentially as they are.

The offered lands area would be administered under the laws pertinent to private property. Therefore, the owners would be free to develop any lands in their possession.

Impacts to Threatened, Endangered, and Other Species

Rejection of the Proposed Action Alternative would have no effect on special status species. Therefore, the present biological conditions would remain essentially the same.

Impacts to Water Resources

Under this alternative the gravel mining would take place but no residential/business development would occur along County Road 252A (formerly State Road 22). The impacts for the gravel mine would be as much as 10 acres feet of water per year. With no change in ownership there would be no impact to grazing permittees or their water rights.

Impacts to Wildlife

Under the No Action Alternative, the public would continue to have access to recreational hunting and other non-hunting wildlife oriented recreation. The existing land ownership pattern would remain as it is, and numerous opportunities to block up lands and to better manage wildlife habitat in WSAs, ACECs, riparian areas, and SMAs through consolidation would be postponed.

Impacts to Geology/Minerals/Paleontology

Rejection of the Proposed Action Alternative would keep the selected area's mineral estate within the jurisdiction of the Federal government and the public. Since the Reasonable Foreseeable Development potential for mining minerals other than sand and gravel is low, as stated in the mineral report, minimal effect would occur from mining or developing these commodities.

However, the sand and gravel resources could then be mined under the pertinent Federal regulations instead of under the Santo Domingo Pueblo and the BIA, and the potential royalties would instead benefit the public. The Federal government and the American public would benefit from royalties that could be generated from mining as much as 200 million cubic yards of sand and gravel resources. However, due to limits of economic recovery as well as Pueblo traditional and cultural conflicts present in this area, it would be unlikely that all this material would ever be mined by the BLM. However, as stated in Chapter Three, the Santo Domingo Pueblo would not directly benefit from any royalties related to mining the selected land area.

Because the exchange would not occur under the No Action Alternative, the mineral estate and the paleontological resources on the offered lands would not come under Federal jurisdiction and protection and therefore surface disturbance could occur.

Impacts to Land Uses

Current access by private landowners would be maintained across public lands under the No Action Alternative. Utility companies, such as the Public Service Company of New Mexico, would work with BLM to obtain new rights-of-way for new power lines and pipelines. As neighboring communities grow, the opportunity for state and local governments and non-profit organizations to obtain public lands through the Recreation and Public Purposes Act (R&PP) would occur at less than fair market value for parks, schools, etc.

Impacts to Wilderness

The No Action Alternative could affect wilderness resources by the present landownership patterns within and adjacent to WSAs remaining unchanged, perpetuating associated management problems. Opportunities to further enhance WSA management through consolidation would be delayed.

Impacts to Recreation

The BLM retaining the exchange area lands would allow continued recreational opportunities within the area. However, the enhanced recreational opportunities resulting from consolidating land ownership in the specially managed areas now privately owned would be delayed.

Impacts to Visual Resources

The lower quality VRM Class III and IV lands in the proposed exchange area would remain essentially unaffected under the No Action Alternative, except as previously identified in visual resources impacts under the Proposed Action Alternative. Opportunities to strengthen visual resources management in the specially managed areas by acquiring higher quality Class II lands would be lost.

Impacts to Air Quality and Noise

Sand and gravel mining would likely take place in the selected lands. Air quality would decrease as levels of air-borne particulate matter increased. It is expected that the level of air-borne particulate matter would be decreased through the implementation of mitigative measures. Noise levels would increase in the mining area as a result of heavy equipment operation. These noises would be concentrated near the mine and there are no residential areas near the likely mined area, therefore, the impacts to human environment would be low.

Impacts to Hazardous Materials

Under the No Action Alternative, there would be no impacts to hazardous materials.

Impacts to Cultural Resources (Selected Lands)

Rejection of the Proposed Action Alternative would have no effect on cultural resources within the affected exchange area lands. As described previously in this chapter, these lands would receive the same level of protection whether managed by BLM or by BIA and the Santo Domingo Pueblo, since Federal laws and regulations would still apply.

However, no further cultural resources would be brought under Federal protection. Cultural properties would continue to be administered under state law.

Impacts to Cultural Resources (Offered Lands)

Under the No Action Alternative, private landowners would continue to manage cultural resources at their own discretion.

Impacts to American Indian Uses (Selected Lands)

If the proposed exchange were not completed, American Indian (Pueblo) traditional, historical, and cultural access and uses would continue to be impeded by a mixed pattern of land ownership and lack of privacy, which probably would increase because of the ever-growing population in the nearby areas.

Impacts to American Indian Uses (Offered Lands)

Under the No Action Alternative, access for and protection of American Indian (Pueblo) traditional, historical, and cultural uses would continue to be subject to the discretion of the private landowners.

Impacts to Rangeland Management

Choosing the No Action Alternative would have no effect on existing livestock grazing uses. The grazing leases would continue to be managed by the BLM, and the allottees would not be adversely affected by losing all or most of their grazing privileges. In addition, there would be no need for the allottees to negotiate agreements with the Santo Domingo Pueblo and the BIA.

Impacts to Socio-Economic Conditions

Under the No Action Alternative, the Pueblo people's use for traditional cultural practices would continue to be interrupted by recreational uses of the public who use the area as open space primarily for recreational purposes. Neither the Pueblo use nor the public use is documented specifically nor has the use been quantified; the conflicts that exist have probably existed for some time and [supposedly] have been tolerated. The increased concentration of population and development in the area undoubtably intensifies the [hidden] conflicts.

Utility rights-of-way extend through the selected lands and monitoring and maintenance there (under the No Action Alternative) would also conflict with traditional cultural practice unless there is close coordination between the utility companies and the Pueblo leaders. Additional rights-of-ways could be approved, likely increasing any present conflicts.

Three livestock grazing allotments are authorized on the selected lands and 4,665 animal unit months of livestock grazing are used by livestock operators who have social values associated with the ranching lifestyle. Permits for livestock grazing would continue under this alternative, and the ranching lifestyle would be maintained.

Other economic activities such as mining and real estate subdivision developments would cause additional opportunities for interference with traditional cultural practices.

The economic impacts for mineral development under this alternative would be similar to and nearly equal to those identified in Alternative B.

The in-lieu-of-tax payments in 1998 for Sandoval County was estimated at $1,439,305. The entitlement acres total 926,060, making an average payment of $1.55 per acre. The selected acres would represent approximately $11,400 of the current in-lieu-of tax payment.

SHORT-TERM USE VERSUS LONG-TERM PRODUCTIVITY

This section identifies the trade-offs between short-term use and long-term productivity of the resources involved in the Proposed Action Alternative. For this analysis, short term refers to the period involved for implementing the plan (within approximately five years), and long term refers to a 5 years or more (unless otherwise noted under a specific resource).

Short term use would not interfere with potential for long term productivity for any of the alternatives.

IRREVERSIBLE AND IRRETRIEVABLE COMMITMENT OF RESOURCES

Proposed Action Alternative– The irreversible impacts likely to occur under this alternative would be the production and use of 500,000 to 750,000 cubic yards of sand and gravel. Once produced and used this resource would no longer be available. An additional irreversible impact would be the loss of 7,376 acres of public land to general public access. On the positive side this land would become available for Pueblo traditional cultural use.

The irretrievable impacts on less than 100 acres per year would occur as the vegetative material removed to make way for sand and gravel production is not available for wildlife, livestock or other uses.

Alternative B--The irreversible impacts likely to occur under this alternative would be the production and use of 1.0 to 1.5 million cubic yards of sand and gravel per year. Once produced and used this resource would no longer be available. An additional irreversible impact would be the loss of 7,376 acres of public land to general public access. On the positive side this land would become available for Pueblo traditional cultural use.

No Action Alternative--The irreversible impacts likely to occur under this alternative would be the production and use of 1 to 1.5 million cubic yards of sand and gravel per year. Once produced and used this resource would no longer be available.

The irretrievable impacts on less than 100 to 200 acres per year would occur as the vegetative material removed to make way for sand and gravel production is not available for wildlife, livestock or other uses.

CUMULATIVE IMPACTS (SELECTED LANDS)

Proposed Action Alternative--This alternative, through the conservation easement, is intended to maintain ecological sites on 6,076 acres of the selected lands. Surface disturbing activities would not take place on these lands. Ecological sites would be maintained on an additional 15,627 acres in the area adjacent to the selected land. This acreage is currently in Federal ownership with 9460 acres proposed for exchange and 6,167 acres to be retained as the Ball Ranch ACEC. It is expected that only the ACEC acreage would continue to be available for general public use. Current habitat would be maintained on approximately 21,700 acres.

Ecological site conditions on offered lands are not likely to be changed in the short-term. In the long-term treatments would be applied to some acres to move their ecological condition toward their potential natural condition (PNC).

A major water use associated with the exchange would result from sand and gravel mining. The proposed action would result in at least one mining operation. Based on data from one of the existing nearby operations it is estimated that the proposed operation would use approximately 5 acre feet of water per year. The total water use for sand and gravel mining between Bernalillo and the selected land area is estimated not to exceed 25 acre feet per year. We do not have the data to estimate all water uses.

Lands available for public recreational use would be reduced by the 7,376 acres of selected lands under this alternative. In recent months title to an additional 27,884 acres have been transferred to or are being considered for transfer to pueblo ownership in either Sandoval or Santa Fe Counties. Completion of these transfers would eliminate 35,260 acres from general public access. Some of these acres may be replaced by offered lands in these same Counties. Others may become available in other Counties. All of the acres should be replaced in the accessible federal lands category but they may be in other less accessible locations.

Social and economic impacts under this alternative indicate that the pueblo would control use on an additional 7,376 this should reduce interruptions to the exercise of traditional cultural practices. The pueblo currently has 48,859 acres on which they control access and use. It would on the other hand eliminate general public use of these additional 7,376 acres of land. These changes bring social changes to the lives of potential and/or former land users.

Economically jobs and income will be impacted. Sandoval County's 1998 employment estimates show mining accounting for less than 1 percent of the County jobs and personal income. There were 76 mining jobs, by place of employment, for 1998. The Pueblo's potential mining operation would be expected to nearly double that number in direct employment impacts. The indirect effects would be expected to add an approximately equal number bringing the total mining employment to near 230 jobs. This total would be less than one percent of the 1998 Sandoval County non-farm wage and salary employment.

Alternative B--This alternative, in the long-term, would maintain ecological sites on 3,276 acres of the selected lands. Ecological sites would be maintained on an additional 15,627 acres in the area adjacent to the selected land. This acreage is currently in Federal ownership with 9,460 acres proposed for exchange and 6,167 acres to be retained as the Ball Ranch ACEC. It is expected that only the ACEC acreage would continue to be available for general public use. Current habitat would be maintained on approximately 18,900 acres.

Ecological site conditions on offered lands are not likely to be changed in the short-term. In the long-term treatments would be applied to some acres to move their ecological condition toward their potential natural condition (PNC).

A major water use associated with this alternative would result from residential/business development and sand and gravel mining. This alternative proposes development of two or more mining operations. Based on data from one of the existing nearby operations it is estimated that the proposed operations would use approximately 15 acre feet of water per year. The total water use for sand and gravel mining between Bernalillo and the selected land area is estimated not to exceed 40 acre feet per year. The estimate of water use for proposed residential/business development is based on Albuquerque useage and is estimated at 33 to 67 acre feet per year. The cumulative use including local mining and actions under this alternative are estimated between 70 and 110 acre feet per year. We do not have the data to estimate all water uses.

Lands available for public recreational use would be reduced by the 7,376 acres of selected lands under this alternative. In recent months title to an additional 27,884 acres have been transferred to or are being considered for transfer to pueblo ownership in either Sandoval or Santa Fe Counties. Completion of these transfers would eliminated 35,260 acres from general public access. Some of these acres may be replaced by offered lands in these same Counties. Others may become available in other Counties. All of the acres should be replaced in the accessible federal lands category but they may be in other less accessible locations.

Social and economic impacts under this alternative indicate that the pueblo would control use on an additional 7,376 this should reduce interruptions to the exercise of traditional cultural practices. The pueblo currently has 48,859 acres on which they control access and use. It would on the other hand eliminate general public use of these additional 7,376 acres of land. These changes bring social changes to the lives of potential and/or former land users.

The economic impacts for this alternative for sand and gravel mining would be similar to the impacts of the proposed action alternative. The magnitude of the impacts would be increased because additional acres would be available for development. Two operations would be expected to add nearly 150 direct jobs. With the indirect employment the total mining related increase in employment would approach 300 jobs under this alternative. Construction employment would increase related to the residential and business construction. There is no specific plan for this development at this time therefore it is assumed that it would occur gradually over a ten to fifteen year period and that the direct jobs would not exceed 100 in any given year. Indirect construction employment would likely add nearly another 100 jobs. These jobs would bring Sandoval County's exchange related employment increase to just over 2 percent of the County's 1998 non-farm wage and salary employment.

No Action Alternative--This Alternative, in the short-term, would maintain the ecological sites on approximately 23,000 acres of public lands included as and near the selected lands. In the long-term 2,000 to 3,000 acres of this land would be mined for sand and gravel creating ecological site disturbance. These acres would be reclaimed and returned to similar or more desirable ecological conditions. All of these acres would be available for general public use except during the mining and reclamation periods. Current habitat would be maintained on this land except during the mining and reclamation periods.

The ecological site condition on the offered lands would most likely remain unchanged. This decision would remain in control of the private land owner.

A major water use associated with the selected land area under the No Action Alternative would result from sand and gravel mining. The action would likely result in at least two mining operations. Based on data from one of the existing nearby operations it is estimated that the proposed operation would use approximately 10 acre feet of water per year. The total water use for sand and gravel mining between Bernalillo and the selected land area is estimated not to exceed 30 acre feet per year. We do not have the data to estimate all water uses.

Social impacts would not change under this alternative. Economic impacts would be similar to and nearly equal to the cumulative mining impacts show for alternative B. These jobs would bring Sandoval County's mining related employment to approximately 1.3 percent of the County's 1998 non-farm wage and salary employment by place of work.

The Pueblos would continue to have shared access to the 16,836 acres of the selected lands.

Environmental Justice

Since two exchanges are being considered and one additional alternative needs to be considered (the NEPA Alternative), the cumulative effects would be the exclusion of public access to a total of approximately 16,836 acres of land in the currently proposed exchanges. Approximately 18,000 acres are being acquired by the Santo Domingo through a legislative global settlement associated with the Tent Rocks area, bringing the total acreage from which the public access would be excluded to approximately 35,000 acres. The Pueblo people would have an additional 35,000 acres on which they control surface use, and, therefore, they would have increased opportunities to carry on their traditional cultural practices.

The Santo Domingo and San Felipe Pueblo people are a minority (in New Mexico) and low income. The proposed alternative would positively affect as related to Environmental Justice. They will be in control of an additional 35,000 acres of land used for traditional cultural practices, and they will also have additional jobs and economic resources. There has been consistent consultation with the Pueblo's regarding this proposed land exchanges. Impacts to the Pueblos are expected to be positive for them.

CHAPTER 5

CONSULTATION AND COORDINATION

INTRODUCTION

This chapter describes the consultation and coordination activities the BLM has carried out while preparing this DEIS. Public comments on the draft and BLM responses to them will be included in this chapter of the Final EIS.

Consultation and coordination have occurred in a variety of ways throughout the EIS process. Both formal and informal efforts have been made to involve the public, other Federal agencies, American Indian (Pueblo) tribal groups, and State and local governments. More detailed documentation of this effort is on file at BLM's Albuquerque Field Office, as is a complete list of all those contacted.

CONSULTATION REGARDING WILDLIFE

The BLM must consult with the U.S. Fish and Wildlife Service under Section 7 of the Endangered Species Act of 1973 (see Appendix D) before any agency project is initiated that may affect any federally listed, threatened, endangered and other special status species or its habitat. This proposed land exchange is considered a major Federal action, so the BLM initiated informal consultation with the FWS.

The Biological Assessment for this DEIS (see Appendix D) found that the Proposed Action Alternative would have "No Effect" on all listed, proposed and candidate species due to the lack of appropriate habitat to support any of the species within the affected area. Because a finding of "No Effect" was identified for all species involved, no formal concurrence on the determinations was requested from the FWS.

PERSONS AND AGENCIES CONSULTED (PUBLIC PARTICIPATION)

Public participation in this DEIS is a dynamic process that continues throughout the EIS process. In addition to formal public participation, informal contact occurs frequently with public land users and interested parties. All applicable public participation is documented and analyzed in the EIS process and kept on file in the field office.

Public involvement is essential to the success of the EIS; although public input is always welcome, BLM provided these specific opportunities for public comment beginning with background taken from the Ball Ranch Exchange Environmental Assessment (EA; Sept., 1998, BLM.):

A Notice of Exchange Proposal (NOEP) was published in the *Albuquerque Journal* and *The Santa Fe New Mexican* for four consecutive weeks beginning on April 30, 1996. This publication notified the public of the proposal identified in Chapter 2 under Proposed Action Considered but Dropped. A Notice of Decision was also published from February 7 through March 3, 1997. An amended Notice of Decision was published on April 29, through May 20, 1998. This notice was withdrawn and a Notice of Exchange Proposal was published on July 20 and 27 and August 3 and 10, 1998. The EA was published in September 1998.

To begin the DEIS process, letters were sent to interested parties on Nov. 4, 1999, which informed them that BLM was considering two new land exchange proposals involving the San Felipe and Santo Domingo Pueblos (which superseded the original three-way proposal with the State of New Mexico included). A Notice of Exchange Proposal (NOEP)/Notice of Intent (NOI) to complete an EIS was published in the Albuquerque Journal (Nov. 8, 15, 22, and 29, 1999) and the Federal Register (Nov. 9, 1999). The scoping period ended 45 days after publication in the Federal Register (on or about Dec. 27, 1999).

The public was invited to either submit comments on the scoping comment sheet enclosed with their letter or to attend an open house which was held at the BLM's Albuquerque Field Office on Dec. 2, 1999 (or to do both). BLM personnel were available at the open house to answer pertinent, specific questions and detailed maps were available there for review of the proposed land exchange. (The scoping process also included a news release about the proposed exchange.)

Individuals and organizations consulted during the exchange process include those in Table 5-1. The BLM staff members who prepared this DEIS are listed in Table 5-2. Correspondence letters received on public notices (as of Jan. 5, 2000, are listed on the Index following Table 5-2.

TABLE 5-1

INDIVIDUALS AND ORGANIZATIONS CONSULTED

Organization	Specialists
Santo Domingo Pueblo	Former Governor Ernest Lovato, Governor Tony Tortalita Bennie Atencio Members of the Tribal Council & Lands Committee Richard Hughes
State Land Office	Olivia Ximenes
New Mexico Historic Preservation Division	Elizabeth Oster, Lynn Sebastian
U.S. Fish and Wildlife Service	Anne Cully
New Mexico Department of Game and F ish	Bill Montoya
New Mexico Highway Department	Paul Martinez, Mike Pope
Public Service Company of New Mexico	Bill Halpin, Scott Berger, Dave Kirkland
The Nature Conservancy	Bill Waldman

See Mailing List (Appendix G) for rights-of-way holders, landowners, interested Federal, State and local agencies, and individuals who expressed an interest in receiving information about this proposed exchange.

TABLE 5-2

LIST OF PREPARERS

Debby Lucero, Project Coordinator
Dan Armstrong, Rangeland Management Specialist
Kent Hamilton, Community Planner/EA Coordinator
M'Lee Beazley, Desk top Publishing/Printing Specialist
John Bristol, Outdoor Recreation Planner
Steve Fischer, Watershed Team Lead
Randy Legler, Biologist
Brian Lloyd, Physical Scientist
John Roney, Archeologist
Anna Salas, Support Service Specialist
David Sitzler, Mining Engineer
Linda Talley-Branch, Contract Writer/Editor
Jerry Wall, Soils Scientist

TABLE 5-3

INDEX OF COMMENTS
(Santo Domingo Land Exchange
Comments Received During Public Scoping)

DATE OF CORRESPONDENCE	DATE RECEIVED BY BLM	NAME/TITLE OF CORRESPONDENCE	ORGANIZATION REPRESENTED
November 17, 1999	November 17, 1999	Rob Roberts	PNM - Gas & Electric Service
November 21, 1999	November 24, 1999	Frances Newsom	Landowner
November 26, 1999	November 26, 1999	K. Lynn Berry	NM State Hwy & Transportation Department
November 26, 1999	November 26, 1999	Pat D. Montoya	Heirs of La Majada Grant
December 2, 1999	December 2, 1999	Michelle Gallegos	Plains Electric G&T
December 6, 1999	December 8, 1999	Paul P. Martinez	NM State Hwy & Transportation Department
December 8, 1999	December 10, 1999	William R. Waldman	The Nature Conservancy of NM
December 21, 1999	December 27, 1999	D.N. (Dave) Daupert	Equilon Pipeline Co.
December 21, 1999	December 29, 1999	Phillip Chappell	Recreation User
December 21, 1999	December 21, 1999	Cecil Carnes, Jr.	Landowner
December 28, 1999	December 27, 1999	John F. McCarthy, Jr.	Attorney for Mr. & Mrs. Edmund Ball
December 28, 1999	December 28, 1999	Alfred L. Baca	Landowner
December 29, 1999	December 30, 1999	Commissioner Ray Powell	NM State Land Office
December 30, 1999	December 30, 1999	John P. Salazar	Attorney representing Diamond Tail Ranch
December 30, 1999	December 30, 1999	Carol M. Parker	Landowner in Placitas
January 4, 2000	January 4, 2000	Stephen L. McDowell	Public Land User
September 21, 2000	September 22, 2000	John P. Salazar	Attorney representing Diamond Tail Ranch
September 27, 2000	September 28, 2000	John P. Salazar	Attorney representing Diamond Tail Ranch

APPENDIX A

MISSION OF THE BUREAU OF LAND MANAGEMENT

The Bureau of Land Management (BLM) administers public lands within a framework of numerous laws. The most comprehensive of these laws is the Federal Land Policy and Management Act of 1976 (FLPMA). All Bureau policies, procedures, and management actions must be consistent with FLPMA and the other laws that govern use of the public lands--it is the mission of BLM to sustain the health, diversity, and productivity of the public lands for the use and enjoyment of present and future generations.

(BLM is responsible for the balanced management of the public lands and resources and their various values so that they are considered in a combination that will best serve the need of the American people. Management is based upon the principles of multiple use and sustained yield, a combination of uses that takes into account the long-term needs of future generations for renewable and non-renewable resources. These resources include recreation, range, timber, minerals, watershed, fish and wildlife, wilderness, and natural, scenic, scientific, and cultural values.)

APPENDIX B

ACRONYMS

ACEC	Area of Critical Environmental Concern
ARPA	Archeological Resources Protection Act
ASTM	American Society for Testing and Materials
AUM	animal unit month
BIA	Bureau of Indian Affairs
BLM	Bureau of Land Management
EA	Environmental Assessment
EIS	Environmental Impact Statement
ESA	Environmental Site Assessment
FLEFA	Federal Land Exchange Facilitation Act (Aug. 20, 1988)
FLPMA	Federal Land Policy & Management Act (1976)
IBLA	Interior Board of Lands Appeal (Department of)
MOU	Memorandum of Understanding
NOD	Notice of Decision
NAGPRA	Native American Grave Protection & Repatriation Act
NEPA	National Environmental Policy Act of 1969
NOEP	Notice of Exchange Proposal
NOI	Notice of Intent
NPS	National Park Service
NTP	Notice to Proceed
PL	Public Law
RMP	Resource Management Plan
ROW	Right-of-Way
R&PP	Recreation and Public Purposes (Act
RPRA	Rio Puerco Resource Area (Albuquerque Field Office)
SARA	Superfund Amendments and Reauthorization Acts (of 1986)
SLO	State Land Office (New Mexico)
SMA	Special Management Area
TUA	Temporary Use Area
USDI	United States Department of the Interior
VRM	Visual Resource Management
WSA	Wilderness Study Area

APPENDIX C

MAJOR LAWS AND REGULATIONS GOVERNING PROPOSED LAND EXCHANGE AREA DEIS (law/year/summary)

Area of Critical Environmental Concern (ACEC). An area of public land where special management attention is needed to prevent irreparable damage to important historic, cultural or scenic values, fish and wildlife resources or other natural systems or processes, or to protect life and safety from natural hazards.

American Indian Religious Freedom Act of 1978 (P.L. 95-341). This Act makes it a policy of the government to protect and preserve for American Indians, Eskimos, Aleuts, and Native Hawaiians their inherent right of freedom to believe, express, and exercise their traditional religions. It further directs various Federal agencies, etc., responsible for administering relevant laws to evaluate their policies and procedures in consultation with Native traditional regligious leaders to determine changes necessary to protect and preserve Native American cultural and religious practices.

Antiquities Act of 1906 (43 CFR 3, 34 Stat. 225). This act was the first general act providing protection for archeological resources. It protects all historic and prehistoric sites on Federal lands and prohibits excavation or destruction of such antiquities without the permission of the Secretary of the Department having jurisdiction.

Archeological Resources Protection Act (ARPA) of 1979 (P.L. 96-95). This act supplements the provisions of the Antiquities Act and makes it illegal ot excavate or remove from Federal or Indian lands any archeological resources without a permit from the land manager. . . those resouces excavated from Indian lands remain the property of the Indian or Indian Tribe having rights of ownership over such resources.

BLM's Wilderness Management Policy of 1983. Governs how BLM manages lands administered by BLM which are designated by Congress as part of the National Wilderness Preservation System (established by the Wilderness Act [Act of Sept. 3, 1964]. It applies to public lands specially designated as wilderness by an Act of Congress (it closely parallels the U.S. Forest Service's wilderness management policy).

Clean Air Act (42 U.S.C. 7401) and Amendments of 1970. The main purpose of this act was to . . . "protect and enhance the quality of the Nation's air resources so as to promote the public health and welfare and the productive capacity of its population. . ." and "to encourage and assist the development and operation of regional air pollution control programs. It requires the EPA to publish national primary standards to protect public health and more strigent national secondary standards to protect public welfare (40 CFR 50). States which are divided into air quality control regions and local governments are responsible for prevention and control of air pollution.

Cooperative Agreement for Range Improvement (4120.3-2). Taylor Grazing Act of specifies the shared cost of a project, and title to a structural or removable project is shared by the United States and the permittee. Title to non-structural or non-removable projects is held solely in the name of the United States.

Endangered Species Act of 1973 (P.L. 93-205). The purpose of this act is to provide protection for animal and plant species that are currently in danger of extinction (endangered) and those that may become so in the foreseeable future (threatened). Section 7 of the act requires Federal agencies to ensure that all federally associated activities within the U.S. do not have adverse impacts on the continued existence of threatened or endangered species or on designated areas (critical habitats) that are important in conserving those species. Agencies must consult with the U.S. Fish and Wildlife Service to determine the potential impacts a project may have on protected species.

Federal Land Exchange Facilitation Act (FLEFA) of August 20, 1988 (amended FLPMA). Contains provisions to facilitate and expedite land exchanges by establishing uniform rules and regulations for appraisals, and procedures and guidelines for resolution of appraisal disputes.

Federal Land Policy and Management Act (FLPMA) of 1976 (P.L. 94-579, 90 Stat. 2743). This law requires several actions including land use planning and coordination with State and local governments. Section 102 (a)(1) states that, "the public lands be retained in Federal ownership, unless as a result of the land use planning procedures provided for in this Act, it is determined that disposal of a particular parcel will serve the national interest."

Interim Management Policy For Lands Under Wilderness Review of 1995. The purpose of the policy is to guide BLM staff in the specific decisions that arise every day in the management of lands under wilderness review.

National Environmental Policy Act (NEPA) of 1969 (P.L. 91-190, as amended by P.L. 94-52 and P.L. 94-83). The main purposes of the act were to declare a national policy which encourages productive and enjoyable harmony between man and his environment; to promote efforts which will prevent or eliminate damage to the environment and biosphere and stimulate the health and welfare of man; to enrich the understanding of the ecological systems and natural resources important to the Nation; and to establish a Council on Environmental Quality.

National Historic Preservation Act (NHPA) of 1966 (P.L. 89-665), as amended (P.L. 95-515). This act establishes as Federal policy the protection of historic sites and values in cooperation with other nations, States, and local governments and establishes a program of grants-in-aid to States for historic preservation activities. Federal agencies are required to consider the effects of their undertakins on historic resources and to give the President's Advisory Council a reasonable opportunity to comment on those undertakings.

Recreation and Public Purposes Act of 1954. Authorizes the Secretary of the Interior (under special conditions) to sell or lease public domain lands to State and local governments and to qualified non-profit organizations for recreation and other public purposes such as campgrounds, schools, fire houses, landfills, parks, law enforcement, facilities etc.

Special Management Areas (SMA). Areas requiring special management by BLM to protect one or more resources values; it may include non-public lands that BLM wishes to acquire or to bring under a Cooperative Management Agreement to better manage the valued resource. Activity plans are prepared for SMAs; the SMAs may be given designations under various existing labels such as "Area of Critical Environmental Concern" or "Research Natural Area." These areas are not necessarily "locked up" from development if the development activity does not conflict with the goals for the area.

Superfund Amendments and Reauthorization Act of 1986 (SARA; P.L. 99-499). This act extensively amends the Superfund Act of 1980. Its major goals include more stringent and better defined cleanup standards, emphasizing remedial actions that permanently and significantly reduce hazardous situations. It requires EPA to revise the Hazard Ranking System to more accurately reflect the degree of risk to human health and the environment. SARA adds damage to natural resources and contamination of ambient air as criteria to be considered in evaluating potential hazards.

Taylor Grazing Act of 1934 (as amended [43 U.S.C. 315]); Section 4 (August 28, 1937 [43 U.S.C. 1181(d)] Range Improvement Permit) Taylor Grazing Act of 1934 (as amended [43 U.S.C.315]); - The primary purpose of the act was to stop continuing injury to the public rangelands through overgrazing, soil deterioration, and other misuse of the natural resources of this vast area mainly in the West. The act also authorized establishment of grazing district--a total area of 80 million acres--for use of the livestock industry. Grazing permits were issued within each district. And isolated tracts not within a grazing district were leasable, with preference given to adjacent or nearby landowners in the stockraising business.

Grazing Permit (Section 4 Permit) (August 28, 1937 [43 U.S.C. 1181(d)] - means a document authorizing use of the public lands within an established grazing district. Grazing permits specify all athorized use including livestock grazing, suspended use, and conservation use. Permits specify the total number of AUM’s apportioned, the area authorized for grazing use, or both.

Wilderness Study Area (WSA); a roadless area or island that has been inventoried and found to have wilderness characteristics as described in Section 603 of FLPMA and Section 2(c) or the Wilderness Act of 1964 (78 Stat. 891).

APPENDIX D

BIOLOGICAL ASSESSMENT
FOR
PROPOSED SANTO DOMINGO LAND EXCHANGE

TABLE OF CONTENTS FOR APPENDIX D

INTRODUCTION

This Biological Evaluation (Consultation #2-22-00-I-161) has been prepared to analyze the selected alternative as identified in the Environmental Impact Statement (EIS) for the Santo Domingo Land Exchange located in the Albuquerque Field Office (AFO) Bureau of Land Management (BLM). It addresses the exchange of public lands out of federal ownership and evaluates all listed, proposed and candidate species potentially found within Sandoval and Santa Fe Counties (refer to Table 1).

Seven federally listed, proposed, and candidate species are known or have the potential to occur in Sandoval and Santa Fe Counties (USDI, FWS 2000). However, because of the land ownership patterns and the specific habitats used by these species, the animals/plants may occur within the counties but not specifically on public lands within the land exchange area. The potential for these species' presence, their habitats within the area, and any potential impacts on them resulting from implementation of the selected alternative are examined in this document.

DESCRIPTION OF THE SELECTED ALTERNATIVE (EXCHANGE PROGRAM)

The primary objective of this program is to exchange isolated and less manageable public lands (7,376 acres) with other land holders (Santo Domingo Indian Tribe) to help acquire in-holding within wilderness areas and block-up areas of public land that would be more manageable.

SPECIES IDENTIFICATION/DETERMINATION

The AFO has prepared this Document on the threatened, endangered, proposed and candidate species shown in Table 1, as identified by the U.S. Fish and Wildlife Service (FWS).

The BLM has determined, based on this Biological Assessment, that the exchange of public lands will result in the following determinations for all the listed, proposed, or candidate species: "No Affect" (refer to Table 1).

CUMULATIVE IMPACTS

Cumulative effects are those effects of future non-federal (State, local government, or private) activities on endangered and threatened species or critical habitat that are reasonably certain to occur in the foreseeable future. The following are those non-federal actions that may affect those species and/or their habitats. These actions include: recreation uses, private subdivisions, livestock grazing, agriculture, resource extraction, silviculture and road construction. Refer to the species evaluation section for an analysis of cumulative impacts for each species.

SPECIES EVALUATIONS

Black-Footed Ferret (*Mustela nigripes*)

This species is usually associated with prairie dog towns in grassland plains, semi-arid grasslands and adjacent mountain basins. The black-footed ferret historically occurred over most of New Mexico (USDI, BLM 1984). The last confirmed sighting in New Mexico was in 1934 (USDI, BLM 1995). No black-footed ferrets are known to exist other than the captive and reintroduced populations in Wyoming, Montana, South Dakota, and Arizona. However remnant populations may still exist in portions of the former range (*ibid*).

The best information available indicates that the black-footed ferret is extirpated from the wild in New Mexico (NMDG&F 1996, 1998). However, in 1998, a captive breeding project was initiated in New Mexico at the Vermejo Park Ranch near Raton, New Mexico.

The most recent information from the FWS (USDI, FWS 1989, 2000) indicates that prairie dog towns of the following sizes are necessary to maintain a black-footed ferret population: (a) 80 acres for black-tailed prairie dogs, and (b) 200 acres for Gunnison's prairie dogs.

An evaluation for the presence of prairie dog colonies to support black-footed ferrets was conducted within the area (USDI, BLM 2000-Refer to Appendix A). No prairie dog colonies of size necessary to support black-footed ferrets were identified within the area.

TABLE 1

THREATENED AND ENDANGERED, PROPOSED, AND CANDIDATE SPECIES

Species	Classification	Determination of Affect	County
Mammals			
black-footed ferret	Endangered	No Affect	(Both)
Birds			
Southwestern willow flycatcher	"	No Affect	(Both)
bald eagle	Threatened	No Affect	(Both)
Mexican spotted owl	"	No Affect	(Both)
whooping crane	Nonessential Experimental	No Affect	(Both)
mountain plover	Proposed Threatened	No Affect	(Both)
Fish			
Rio Grande silvery minnow	Endangered	No Affect	(Both)

It appears from the available literature that grazing (including intense use) does not have a negative impact on prairie dog colonies. In fact, some literature sources support grazing because it seems to increase the density of prairie dog colonies. In particular, black-tailed prairie dogs have been shown to prefer areas with short vegetation cover, which apparently allows them to view predators and maintain a complex social system (Fagerstone and Ramey 1996-1). Rates of prairie dog colony settlement and expansion have been shown to increase under intense livestock grazing and other human disturbance such as homesteading, fencing, cultivation, and the construction of water impoundments (*ibid*. 1996-2). All of these land management practices reduce the height and density of grasses, and provide a desirable environment for prairie dogs to expand and establish new colonies. Fagerstone and Ramey (1996-3) found that prairie dog burrow densities in the Conata Basin of South Dakota increased twice as fast on sites grazed by cattle as on ungrazed sites.

Prairie dog colonies modify the grasslands in a similar manner as grazing cattle do, by their feeding activities. The rodents depend on being able to see terrestrial predators from a distance (*ibid*. 1996-1) and modify vegetation by feeding on grasses and clipping unpalatable plants to ground level (*ibid*. 1996-4). In well-established prairie dog colonies, large areas of bare soil are common (*ibid*. 1996-5).

Prairie dogs were widespread on the Plains throughout the 1800s, being estimated to cover 283 million hectares (about 700 million acres) and to number over 5 billion (*ibid*. 1996-6). To control prairie dog numbers, rodenticides were developed; in the early 1900s millions of hectares were treated with grains containing strychnine and other poisons, significantly reducing prairie dog numbers and eliminating most large colonies. By 1919, after 20 years of control efforts, the area occupied by prairie dogs was reduced to an estimated 40.5 million hectares (100 million acres; *ibid*. 1996-7). In 1971 the estimated occupied areas in the United States was only 566,000 hectares (1.4 million acres; *ibid*. 1996-8). Before that year, these control efforts eliminated approximately 99.8 percent of the prairie dog population in the United States. From the available literature, it appears the decline in prairie dog colonies, and consequently the black-footed ferret throughout the west, was related to federal, state, and local poisoning programs. Also, land use practices reduced available habitat by converting vast areas of the Great Plains to agriculture and urban areas.

The prairie dog population within AFO lands appears to be stable; however, colony sizes fluctuate up and down on a regular basis, mainly due to plague that occurs throughout New Mexico. Plague appears to be the limiting factor in controlling the size of prairie dog colonies within the AFO.

Baseline Data

Historically, large prairie dog towns occurred throughout New Mexico and probably in Sandoval and Santa Fe counties. Due to widespread poisoning programs and habitat alterations of prairie dog colonies, primarily for agricultural and grazing purposes, suitable habitat for the black-footed ferret was basically eliminated from the state.

No black-footed ferrets are known to exist other than the captive and reintroduced populations in Wyoming, Montana, South Dakota, Arizona and New Mexico. The best information available indicates that the black-footed ferret is apparently extirpated from the wild in New Mexico.

Affect Determination

Based on the analysis that no habitat exists (e.g., large prairie dog colonies) necessary to support this species within the area, the BLM has determined that implementation of the land exchange identified within the EIS would result in a "No Affect" situation for the black-footed ferret.

Rationale

No black-footed ferrets are known to exist outside of the captive and reintroduced populations in Wyoming, Montana, South Dakota, Arizona and New Mexico. The best information available indicates that the black-footed ferret is apparently extirpated from the wild in New Mexico.

No habitat (prairie dog colonies) necessary to support this species has been identified on BLM-administered lands within the affected area.

A majority of the Bureau of Land Management (BLM) lands being conveyed (83%) are subject to a conservation easement that restrict activities such as: extraction of minerals, oil and gas development, construction of homes/subdivision, and other surface and sub-surface disturbing actions. This conservation easement would protect the existing wildlife habitats on 6,105 acres (Refer to Appendix B) for a complete description of the restrictions/reservations). The remaining 1,271 acres would be allowed to be developed for (e.g., mining, subdivisions).

Cumulative Impacts

No current or potential habitat exists within the area to support the Black-footed Ferret.

Because the proposed action (land exchange) has a "No Affect" for the Black-footed Ferret, there would be no incremental increase in the existing or foreseeable future cumulative impacts within the AFO for this species. The cumulative impacts presently existing (e.g., federal, private, state activities) for this species would not change due to this action.

Southwestern Willow Flycatcher (*Empidonax traillii extimus*)

The Southwestern willow flycatcher is found along riparian habitats (e.g., rivers, streams and wetlands) of the desert Southwest where dense groves of willows (e.g., *Salix, Baccharis* spp.), arroweed, buttonbrush, boxelder and alder are present, often with a scattered overstory of cottonwood (Tibbitts *et al.* 1994). In some locations, exotic plants including tamarisk and Russian olive are also used for nesting. The bird is associated with multi-layered vegetation in close proximity to slack water. The surrounding vegetation of the nesting areas generally ranges from 12 to 21 feet high (*ibid*). Southwestern willow flycatchers breed in habitat where surface water is present (Sferra *et al.* 1995).

Historically the Southwestern willow flycatcher nested along the major river systems in northern New Mexico. However, as the result of riparian degradation during the past century, very little habitat remains. An evaluation for riparian/wetland habitats to support Southwestern willow flycatchers was conducted within the land exchange area (USDI, BLM 2000-Refer to Appendix A). No current or potential riparian/wetland areas needed to support Southwestern willow flycatchers were identified.

Baseline Data

Historically the Southwestern willow flycatcher nested along the major river systems in northern New Mexico.

No habitats (e.g., riparian/wetland areas) have been identified on BLM-administered lands that would support the Southwestern willow flycatcher within the land exchange area.

Affect Determination

Based on the analysis that no current or potential habitat (e.g., riparian/wetland areas) needed to support this species exists within the exchange area, the BLM has determined that implementation of the proposed action (land exchange) identified in the EIS would result in a "No Affect" situation for the Southwestern willow flycatcher.

Rationale

No current or potential habitat (e.g., riparian/wetland areas) to support the Southwestern willow flycatcher have been identified on BLM-administered lands within the land exchange area.

A majority of the Bureau of Land Management (BLM) lands being conveyed (83%) are subject to a conservation easement that restrict activities such as: extraction of minerals, oil and gas development, construction of homes/subdivision, and other surface and sub-surface disturbing actions. This conservation easement would protect the existing wildlife habitats on 6,105 acres (refer to Appendix B) for a complete description of the restrictions/reservations). The remaining 1,271 acres would be allowed to be developed for (e.g., mining, subdivisions).

Cumulative Impacts

No current or potential habitat exists within the land exchange area to support the Southwestern willow flycatcher.

Because the proposed action (land exchange) has a "No Affect" for the Southwestern willow flycatcher, there would be no incremental increase in the existing or foreseeable future cumulative impacts within the AFO for this species. The cumulative impacts presently existing (e.g., federal, private, state activities) for this species would not change due to this action.

Ongoing Actions

In March, 1997, the BLM completed Section 7 consultation (#2-22-95-I-410) on the Rio Puerco Resource Management Plan for the Southwestern willow flycatcher. The FWS attached seven Conservation Recommendations (CR) to the non-jeopardy opinion. The implementation of the seven conservation recommendations are as follows:

CR-1 Continue flycatcher surveys

The 1998 and 1999 flycatcher surveys were completed as part of a challenge cost sharing agreement with Hawks Aloft. All currently potential and short-term potential habitat areas were surveys three times during the nesting season according to protocol. This will continue to be an ongoing annual effort for those currently potential and short-term potential habitat areas. Migrating flycatchers have been observed during several of the surveys, but no nesting activity has been identified.

CR-2 No livestock grazing should occur within areas considered unoccupied, currently potential flycatcher habitat as well as any areas that become occupied by flycatchers from April 15 to August 15

Bluewater Creek ACEC is the only area that is considered unoccupied, currently potential flycatcher habitat within AFO lands. The area has no grazing year-long. No other areas have become occupied by the flycatchers.

CR-3 No habitat-modifying or vegetative manipulation activities should occur within areas considered unoccupied, currently potential flycatcher habitat. In all other areas, removing vegetation/planting non-native species would require consultation

Bluewater Creek ACEC is the only area that is considered unoccupied, currently potential flycatcher habitat within AFO lands. No habitat or vegetative manipulation is occurring within the Bluewater Creek ACEC. In other flycatcher habitats, planting of native vegetation is occurring on a regular basis. Planting of native vegetation

(willows, cottonwoods) is an ongoing effort to restore riparian habitat on lands managed by the AFO.

CR-4 Summarize trend information so that uplands can be better assessed

In 1998 all of the lotic (running water) segments within the resource area were reevaluated for Properly Functioning Condition. Beginning in July, 1998, an environmental process (EA) was initiated to determine conditions of all grazing allotments, including those with riparian habitat. This EA process will take several years due to the large number of allotments, but will help in the future to summarize upland information and the recovery of riparian communities.

CR-5 Develop a management plan for the flycatcher in the interim until a recovery plan has been completed

The Albuquerque Field Office, Southwestern Willow Flycatcher Management Plan was completed and implemented in 1998.

CR-6 Assess the impacts of winter grazing in riparian habitat

In 1997, a riparian enclosure was established within the Lost Valley riparian pasture. In 2000, a riparian enclosure will be established in the Azabache Riparian pasture, to evaluate winter grazing within the allotments.

CR-7 Continue fencing riparian areas to exclude livestock grazing and track vegetative trends

In 1998, the BLM finished fencing the Coal Creek Allotment, and established a riparian pasture in the Azabache Allotment to protect these riparian areas. As part of a Habitat Management Plan/Environmental Impact Statement (HMP/EIS) for all riparian areas within the AFO, the BLM will be establishing protective measures for all riparian areas identified during the process. The HMP/EIS is anticipated to be completed in the summer of the year 2000.

Bald Eagle (*Haliaeetus leucocephalus*)

Bald eagles are generally associated with medium to large perennial streams, rivers and other water bodies that provide an adequate prey base and appropriate nesting/roosting habitat. Outside of the major river corridors (e.g., Rio Grande, Chama), the bald eagle has been observed to be a migrant only, due to the lack of any large streams, rivers or water bodies.

An evaluation for riparian/wetland habitats to support bald eagles was conducted within the land exchange area (USDI, BLM 2000-Refer to Appendix A). No foraging habitat (e.g., rivers/streams/waterbodies) or roosting habitat (e.g., large trees) needed to support bald eagles were identified.

The breeding population of bald eagles has historically been low, although New Mexico does provide habitats for wintering and migration. Food availability is a major factor influencing bald eagle distribution. Fish is generally considered the preferred prey base for bald eagles. However, waterfowl (particularly dead or crippled individuals), dead livestock, rabbits and small mammals can be used as a prey base for a wintering population.

Bald eagles have been observed migrating seasonally through the general area, however, with no habitat to support nesting/roosting (e.g., large trees) or foraging (e.g., streams/rivers/waterbodies), they are not expected to use any of the area.

The bald eagle population is in an upward trend throughout the United States. In July 1994, the FWS proposed to reclassify the bald eagle from endangered to threatened in the lower 48 states, including the southwestern region and Mexico. On August 11, 1995, this reclassification took place.

Baseline Data

No habitats (e.g., rivers/streams/waterbodies) have been identified on BLM-administered lands that would support bald eagles within the land exchange area.

Bald eagles are known to migrate seasonally through Sandoval and Santa Fe Counties, but due to the lack of appropriate habitat on BLM-administered lands within the exchange area, no use of these lands is anticipated.

Affect Determination

Based on the analysis that no habitats exists (e.g., streams/rivers) to support this species within the land exchange area, the BLM has determined that implementation of the proposed action (land exchange) identified in the EIS would result in a "No Affect" situation for the bald eagle.

Rationale

No habitats (e.g., streams/rivers/waterbodies) have been identified on BLM-administered lands that would support the bald eagle within the land exchange area.

Bald eagles are known to migrate seasonally through Sandoval and Santa Fe Counties, however, with no habitat to support nesting/roosting (e.g., large trees) or foraging (e.g., streams/rivers/waterbodies), they are not expected to use any of the area.

A majority of the Bureau of Land Management (BLM) lands being conveyed (83%) are subject to a conservation easement that restrict activities such as: extraction of minerals, oil and gas development, construction of homes/subdivision, and other surface and sub-surface disturbing actions. This conservation easement would protect the existing wildlife habitats on 6,105 acres (refer to Appendix B) for a complete description of the restrictions/reservations). The remaining 1,271 acres would be allowed to be developed for (e.g., mining, subdivisions).

Cumulative Impacts

No current or potential habitat exists within the land exchange area to support the bald eagle.

Because the proposed action (land exchange) has a “No Affect” for the bald eagle, there would be no incremental increase in the existing or foreseeable future cumulative impacts within the AFO for this species. The cumulative impacts presently existing (e.g., federal, private, state activities) for this species would not change due to this action.

Mexican Spotted Owl (*Strix occidentalis lucida*)

The Mexican spotted owl occupies mountainous areas, with its preferred habitat consisting of dense, multi-storied forests with moderately closed to closed canopies. In addition, these owls have been found in canyon systems with little or no tree cover (USDI, FWS 1993). These canyon systems appear to provide the same or similar microclimate as the dense multi-storied forests.

Historically northern New Mexico contained forest stands that no longer exist today. Beginning in the 1800s homesteaders, owners of land grants, and private logging companies removed most of large commercial timber from the area. These past forestry practices have resulted in a lack of any dense, old-growth forests remaining.

An evaluation for forest/canyon habitats to support Mexican spotted owls was conducted within the exchange area (USDI, BLM 2000-Refer to Appendix A). No habitat was identified that would support Mexican spotted owls. The woodland habitat is comprised entirely of scattered piñon-juniper stands, with no canyon habitat occurring within the area. The Mexican Spotted Owl Recovery Plan (USDI, FWS 1995) does not contain specific guidelines for piñon-juniper habitats, which are considered as "Other Forest and Woodland Types" in the plan.

No critical habitat has been designated by the FWS on any BLM lands within any of the exchange area.

Baseline Data

Historically northern New Mexico contained forest stands that no longer exist today. From the 1800s, homesteaders, owners of land grants, and private logging companies removed most of large commercial timber within the area. As the result of these historic forest practices, no habitats that meet the criteria to support this species have been identified on BLM-administered lands within the Albuquerque Field Office.

No specific guidelines have been established for piñon-juniper habitats, which are considered as "Other Forest and Woodland Types" within the U.S. Fish and Wildlife Service's Mexican spotted owl recovery plan.

No habitats (e.g., forest/canyon) exists on BLM-administered lands necessary to support this species within the exchange area. All of the woodland habitat is comprised of scattered piñon-juniper stands.

Affect Determination

Based on the analysis that no habitats exists (e.g., forest/canyon) to support this species within the exchange area, the BLM has determined that implementation of the Santo Domingo exchange identified in the EIS would result in a "No Affect" situation for the Mexican spotted owl.

Rationale

No habitat (e.g., forest/canyon) exists on BLM-administered lands to support this species within the exchange area. All of the woodland habitat is comprised of piñon-juniper stands.

A majority of the Bureau of Land Management (BLM) lands being conveyed (83%) are subject to a conservation easement that restrict activities such as: extraction of minerals, oil and gas development, construction of homes/subdivision, and other surface and sub-surface disturbing actions. This conservation easement would protect the existing wildlife habitats on 6,105 acres (Refer to Appendix B) for a complete description of the restrictions/reservations). The remaining 1,271 acres would be allowed to be developed for (e.g., mining, subdivisions).

Cumulative Impacts

No current or potential habitat exists within the exchange area to support the Mexican spotted owl.

Because the proposed action (land exchange) has a "No Affect" for the Mexican spotted owl, there would be no incremental increase in the existing or foreseeable future cumulative impacts within the AFO for this species. The cumulative impacts presently existing (e.g., federal, private, state activities) for this species would not change due to this action.

Whooping Crane (Grus americana)

The whooping crane breeds mainly at Wood Buffalo National Park, Canada and winters mainly along the Gulf Coast of Texas at the Aransas National Wildlife Refuge. A few whooping cranes raised by foster parents (sandhill cranes) at Grays Lake, Idaho still migrate with sandhill cranes to the Rio Grande Valley, New Mexico. These birds (2 to 4 in number) winter mainly in the Bosque del Apache National Wildlife Refuge, located approximately 20 miles south of Socorro, New Mexico. This population is designated as a non-essential experimental population.

Whooping cranes select an open expanse of shallow water in rivers, lakes, reservoirs and native wetlands for nightly roosting. Feeding sites include the same wetland types as those used during roosting and agricultural fields. The whooping crane typically roosts on sand bars within the Rio Grande flood-plain (NMDG&F 1988, 1995). Whooping cranes seasonally move up and down the Rio Grande corridor during their spring and fall migrations; however, they would be considered rare visitors to the area.

An evaluation for riparian/wetland habitats to support whooping cranes was conducted within the land exchange area (USDI, BLM 2000-Refer to Appendix A). No riparian/agricultural habitat was identified on BLM-administered lands within the land exchange area.

Baseline Data

Historically whooping cranes did not use the Rio Grande Valley for migration; only as the result of a fostering program some birds have migrated with the sandhill crane population, which does use the Rio Grande Valley extensively. This population is designated as a non-essential experimental population.

Within New Mexico, the whooping crane is associated with agricultural fields and valley pastures, particularly where there is waste grain or sprouting crops.

Affect Determination

Based on the analysis that no habitat exists (e.g., rivers/streams) to support this species within the land exchange area, the BLM has determined that implementation of the proposed action (land exchange) identified within the EIS would result in a "No Affect" situation for the whooping crane.

Rationale

Whooping cranes would be considered rare migrants to land exchange area. This population is designated as a non-essential experimental population.
No suitable or potential riparian/agricultural habitat occurs on lands administered by the BLM Albuquerque Field Office within the land exchange area.

A majority of the Bureau of Land Management (BLM) lands being conveyed (83%) are subject to a conservation easement that restrict activities such as: extraction of minerals, oil and gas development, construction of homes/subdivision, and other surface and sub-surface disturbing actions. This conservation easement would protect the existing wildlife habitats on 6,105 acres (refer to Appendix B) for a complete description of the restrictions/reservations). The remaining 1,271 acres would be allowed to be developed for (e.g., mining, subdivisions).

Cumulative Impacts

No current or potential habitat exists within the land exchange area to support whooping cranes.

Because the proposed action (land exchange) has a "No Affect" for whooping cranes, there would be no incremental increase in the existing or foreseeable future cumulative impacts within the AFO for this species. The cumulative impacts presently existing (e.g., federal, private, state activities) for this species would not change due to this action.

Mountain Plover (*Charadrius montanus*)

The mountain plover prefers flat, short-grass prairie and tends to avoid taller grasses and hillsides (USDI, BLM 1995). Suitable habitat occurs in areas often grazed by livestock (*ibid*). The bird prefers habitat comprised of large areas of bare ground and short grass (less than 4-inch-tall stubble). Prairie dog towns and turf farms are likely areas of use. Outside the breeding season, this species occurs in flocks of individuals up to several hundred feeding in alkaline flats, plowed ground, sprouting grain fields and grazed pastures (Terres 1982). Short vegetation, bare ground, and a flat topography are now recognized as habitat-defining characteristics (USDI, FWS 1999). In addition to using prairie dog towns, mountain plovers show a strong affiliation with sites that are heavily grazed by domestic livestock (e.g., near stock watering tanks)(*ibid*).

The mountain plover has been identified in numerous locations throughout northern New Mexico during surveys by the New Mexico Department of Game and Fish in 1995 (Williams 1995). The bird is likely to occur throughout the AFO in areas of short-grass prairie. No critical habitat has been established.

An evaluation for habitat to support Mountain Plovers was conducted within the exchange area (USDI, BLM 2000- Refer to Appendix A). The area is comprised of rolling hills with scattered piñon-juniper woodlands and would not be considered habitat for the Mountain Plover.

Baseline Data

Habitat destruction, primarily resulting from the conversion of prairie ecosystems to agricultural croplands, has been the primary cause of long-term population declines. In the late 1800s this species was also subjected to market hunting.
The current nesting range is restricted to small populations in parts of California, Montana, Wyoming, Colorado, Oklahoma, and New Mexico.
Mountain plovers are successful in using areas grazed by livestock, in fact they preferred areas where grazing livestock/wildlife maintain the ground cover at a short stubble height.

Affect Determination

Based on the analysis that no habitat exists to support this species within the land exchange area, the BLM has determined that implementation of the proposed action (land exchange) identified within the EIS would result in a "No Affect" situation for the mountain plover.

Rationale

Flat short-grass prairies (preferred habitats) do not occur within the area. The habitat within the area consists of rolling hills with scattered piñon-juniper woodlands, and would not be considered habitat for the mountain plover.

Mountain plover habitat is not limited on other AFO lands, and is found throughout the area on BLM-administered and adjacent state and private lands. A mosaic of vegetation and bare ground occurs throughout the AFO lands.

A majority of the Bureau of Land Management (BLM) lands being conveyed (83%) are subject to a conservation easement that restrict activities such as: extraction of minerals, oil and gas development, construction of homes/subdivision, and other surface and sub-surface disturbing actions. This conservation easement would protect the existing wildlife habitats on 6,105 acres (refer to Appendix B) for a complete description of the restrictions/reservations). The remaining 1,271 acres would be allowed to be developed for (e.g., mining, subdivisions).

Cumulative Impacts

No habitat exists within the land exchange area to support the mountain plover.

Because the proposed action (land exchange) has a “No Affect” for mountain plover, there would be no incremental increase in the existing or foreseeable future cumulative impacts within the AFO for this species. The cumulative impacts presently existing (e.g., federal, private, state activities) for this species would not change due to this action.

Rio Grande Silvery Minnow *(Hybognathus amarus*)

The Rio Grande silvery minnow is found in the middle Rio Grande, from Cochiti Dam to the headwaters of Elephant Butte Reservoir. This area has been designated as proposed critical habitat. However, surveys in recent years have identified that the majority of the population now occurs only within the immediate headwaters of Elephant Butte Reservoir.

This species is localized within an area in which the BLM does not administer lands within the habitat of the Rio Grande silvery minnow nor manage any of the waters of the Rio Grande within this area.

An evaluation for riparian/wetland habitats to support Rio Grande silvery minnow was conducted within the land exchange area (USDI, BLM 2000-Refer to Appendix A). No riparian/wetland habitat was identified on BLM-administered lands within the land exchange area.

The AFO is aggressively protecting and enhancing (e.g., fencing, planting) riparian habitats along the tributaries to the Rio Grande that occur on BLM-administered lands (e.g., Rio Puerco, Rio Salado). The agency's goals to restore these habitats to properly functioning condition, not only to benefit the Rio Grande silvery minnow but for many other wildlife species and resource values (e.g., limiting soil erosion).

Baseline Data

The Rio Grande silvery minnow is found in the middle Rio Grande, from Cochiti Dam to the headwaters of Elephant Butte Reservoir. However, surveys in recent years have identified that the majority of the population now occurs only within the immediate headwaters of Elephant Butte Reservoir.

Water availability appears to be the main limiting factor jeopardizing this species. The Rio Grande has dried up numerous times, due mainly to irrigation operations, over the past several decades.

The BLM does not administer lands within the habitat of the Rio Grande silvery minnow nor manage any of the waters of the Rio Grande within this area.

Affect Determination

Based on the analysis that no habitat exists to support this species within the land exchange area, the BLM has determined that implementation of the proposed action (land exchange) identified within the EIS would result in a "No Affect” situation for the Rio Grande silvery minnow.

Rationale

Known distribution of the Rio Grande silvery minnow in New Mexico is limited (Cochiti Dam to Elephant Butte Reservoir). However, surveys in recent years have identified that the majority of the population now occurs only within the immediate headwaters of Elephant Butte Reservoir. The AFO does not administer any public lands or authorize any activities within or adjacent to known habitats of this species.

A majority of the Bureau of Land Management (BLM) lands being conveyed (83%) are subject to a conservation easement that restrict activities such as: extraction of minerals, oil and gas development, construction of homes/subdivision, and other surface and sub-surface disturbing actions. This conservation easement would protect the existing wildlife habitats on 6,105 acres (refer to Appendix B) for a complete description of the restrictions/reservations). The remaining 1,271 acres would be allowed to be developed for (e.g., mining, subdivisions).

Cumulative Impacts

No current or potential habitat exists within the land exchange area to support the Rio Grande silvery minnow.

Because the proposed action (land exchange) has a "No Affect" for the Rio Grande silvery minnow, there would be no incremental increase in the existing or foreseeable future cumulative impacts within the AFO for this species. The cumulative impacts presently existing (e.g., federal, private, state activities) for this species would not change due to this action.

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Appendix A
Field Trip Survey-Wildlife Habitat
San Felipe and Santo Domingo Land Exchanges

James B. Silva (Wildlife/T&E Specialist) and McKinley Ben Miller (Riparian/Forestry Specialist) conducted a field trip to the two land exchange areas on March 1, 2000 to conduct a survey of existing wildlife habitats within the areas. Surveying for habitat associated with the following species was of particularly importance during the field trip due to their potential presence within Sandoval and Santa Fe Counties (FWS 2000)

Species	Status
#1 - Black-Footed Ferret	Endangered
#2 - Mexican Spotted Owl	Threatened
#3 - Southwestern Willow Flycatcher	Endangered
#4 - Bald Eagle	Threatened
#5 - Whooping Crane	Nonessential experimental population
#6 - Mountain Plover	Proposed Threatened
#7 - Rio Grande Silvery Minnow	Endangered

The following were those specific habitat components that were surveyed for based on habitat preference of the potential Special Status Species occurring within the area.

Forest (ponderosa pine/fir/mixed conifer) habitats - #2
Canyon habitats - #2
Flat open grassland/prairie habitats - #1 and 6
Riparian/wetland/Aquatic habitats - #3, 4, 5 and 7
Prairie dog colonies - #1 and 6

Species/Habitat Evaluations

Forest-Canyon Habitats:

Survey Data: No ponderosa pine, fir or mixed conifer habitat was identified within the areas. The areas consists of rolling hills with an evenly scattered over story of piñon-juniper (See photos #1 and #2). The low lying areas in between the rolling hills consisted of ephemeral arroyos that were a few feet to 100 feet deep. There are three large arroyos that bisect the San Felipe Exchange area (Arroyo del Tonque, Arroyo Coyote and Arroyo de la Vega de los Tanos) and one large arroyo the bisects the Santo Domingo Exchange area (Arroyo Largo). The Arroyo del Tonque provides some of the best canyon habitat within both of the areas. The canyon is approximately 50-75 foot deep and from 25 to 100 feet wide with some vertical but mostly broken rock walls. However, the canyon contained no micro-climate habitat that is associated with Mexican Spotted Owl use of canyons.

Flat open grassland/prairie habitats:

Survey Data: No flat grassland/prairie habitat was identified within the areas. The areas consists of rolling hills with an evenly scattered over story of piñon-juniper (See photos #1 and #2). The low lying areas in between the rolling hills consisted of ephemeral arroyos that were a few feet to 100 feet deep. There were some small (<1acre) tracts that occurred around some of the windmills that were generally flat and open with no tree cover. However, these areas were so small and widely scattered that no use of these small tracts would be expected.

Riparian-Wetland-Aquatic Habitats:

Survey Data: No riparian/wetland/Aquatic habitat of the size necessary to support Southwestern willow flycatchers, bald eagle, whooping crane or Rio Grande silvery minnow were identified within the areas. Within the two land exchange areas, artificial waters (wind mills) are present and several have small overflow ponds (20X20 feet) in size. The remainder of the areas consists of ephemeral arroyos that are a few feet to 100 feet deep. There are three large arroyos that bisect the San Felipe Exchange area (Arroyo del Tonque, Arroyo Coyote and Arroyo de la Vega de los Tanos) and one large arroyo the bisects the Santo Domingo Exchange area (Arroyo Largo). All of these arroyos as well as the smaller ones would have running water only during spring snow melt or during intense summer rain storms. The Arroyo del Tonque is approximately 50-75 foot deep and from 25 to 100 feet wide with some vertical but mostly broken rock walls. This arroyo contained some surface water (at the time of the survey) and one lone cottonwood tree (20-30 years old) at one location. However, no other riparian vegetation was observed within this area of the tree or along the remainder of the channel. At the head of the Arroyo del Tonque a windmill with an

overflow pond does exists. It is speculated that the water in the arroyo may be seeping from the pond or downhole in the windmill and that due to the impervious rock layers along the canyon floor, that the water is brought to the surface at this one location.

Prairie dog colonies:

Survey Data: No sign of prairie dog colonies were identified within the two areas. No flat grassland/prairie habitat was identified within the areas that would support prairie dog colonies. The area consists of rolling hills with an evenly scattered over story of piñon-juniper (See pictures #1 and #2). The low lying areas in between the rolling hills consisted of ephemeral arroyos that were a few feet to 100 feet deep. There were some small (<1acre) tracts that occurred around some of the windmills that were generally flat and open with no tree cover. However, none of these areas showed any signs of prairie dog use. The soils in the area consists of gravelly/rocky substrate with very shallow soils, which are not conducive for digging rodents, refer the foreground in photos #1 and #2, and photo #3.

Appendix B
Reservation of Conservation Easement

Provided, however, that the lands conveyed herein, *except* those lands situated in Sections 25, 26 and 35, Township 14 North, Range 6 East NMPM (which are herein referred to as the "Excepted Lands"), shall forever be subject to the following Restrictions, which are intended to preserve such lands in their natural state for the benefit of Grantee and its members, and Grantor shall retain forever the right to enforce such Restrictions, as set forth herein:

Restrictions: The Grantee shall have no right to conduct, or to allow any other persons or entity to conduct, any of the following activities on or with respect to any of the lands that are subject to these provisions (which lands are hereinafter referred to as the "Subject Lands"):

1. The storage, dumping, disposal, release or other use of toxic and/or hazardous materials or the storage, dumping, disposal or release of non-compostable refuse.
2. Any filling, excavating, dredging, mining, drilling and exploration for or extraction of any minerals, hydrocarbons, soils, sand, gravel, rock or other materials on or below the surface; except that nothing herein shall pertain to the activities of any utility company that is granted a valid right-of-way across the lands conveyed herein or any portion of them for installation of a utility line for the transmission of electrical power, telephone service or natural gas, provided that Grantee shall consult with Grantor with respect to: a) the location of any proposed utility right-of-way affecting the Subject Lands, and b) the necessary restoration of lands affected by construction activity on such right-of-way and adjacent lands, prior to consenting to such right-of-way; nor shall anything herein preclude Grantee or any member of Grantee from taking clay or other soils or materials from any of the lands conveyed herein for their use in making pottery, or for any other traditional craft or religious purpose).
3. Any division, subdivision or *de facto* subdivision of the property.
4. Construction of roads.
5. Severance or transfer of any water rights attached to the property.
6. Construction or placement of any buildings, whether permanent or temporary, living quarters of any sort, mobile homes, signs, billboards or other advertising materials, or utility towers or other structures.

Rights of Enforcement: Grantor, through the Bureau of Indian Affairs or its successor agency, shall have the right to enter upon the Subject Lands to enforce the provisions of these Restrictions, and to determine that Grantee's activities are in compliance therewith, all upon prior notice to Grantee and in a manner that does not unreasonably disturb the use of the property by Grantee, consistent with the terms of these Restrictions. Grantor shall also have the right of immediate entry upon the Subject Lands if, in its sole judgment, such entry is necessary to prevent damage to or the destruction of the values protected by these Restrictions. Grantor shall further have the right to take any appropriate legal measure to enjoin any activity on or any use of the property by Grantee or any of its members or any person or entity purporting to act under its permission or authority that is in clear violation of these Restrictions and to enforce the restoration of such areas or features of the Subject Lands that may have been damaged by such activities.

General Provisions: Nothing herein shall be construed as affording to any member of the public any access or right of access to any portion of the lands conveyed herein, or as authorizing Grantor to grant any such right of access to any third person without the express prior written consent of Grantee.

The provisions of these Restrictions and Reservations shall be liberally construed to effectuate their purposes of conserving important habitat for wildlife, to protect rare or unique native plants now or later identified, to conserve the diverse vegetative communities and the wildlife inhabiting these communities, and to preserve the Subject Lands in their present, substantially undisturbed natural state, with significant topological and open-space values, in perpetuity, but without interfering with any uses of the property by the Grantee consistent with the conservation values that are protected hereby. Nothing herein shall be deemed to limit or affect Grantee's right to utilize the surface and/or minerals on or under the Excepted Lands, in such manner as Grantee chooses, including the right to lease or permit to third parties the right to utilize the surface and minerals on or under such lands in any manner that Grantee might, but Grantee shall have no right to utilize or conduct any activities on the Excepted Lands, or to permit any third party to utilize or conduct any activities on the Expected Lands, that would cause a violation of any of the above-state Restrictions with respect to the Subject Lands, and Grantor shall have the right reasonably to condition any lease or permit or other grant of rights in the Excepted Lands by Grantee to any third party so as to insure strict compliance with this provision.

Appendix C
Biological Evaluation
Other Special Status Species (Sandoval County)

Forty BLM sensitive and State of New Mexico Threatened and Endangered species are known or have the potential to occur within Sandoval County (refer to the following list). However, because of the land ownership patterns and the specific habitats used by these species, they may occur with the broad borders of Sandoval County but may not occur on BLM-administered lands within the Santo Domingo Land Exchange area.

Special Status Species (USDI, FWS 2000, NMDG&F 1998 Sivinski and Lightfoot 1995)	Listing
Big free-tailed bat *(Nyctinomops macrotis*)	BS
Goat Peak pika (*Ochotona princeps nigrescens*)	BS
New Mexico meadow jumping mouse *(Zapus hudsonius luteus*)	BS/ST
American martin (Martes americana origenes)	ST
Fringed Myotis (*Myotis thysanodes*)	BS
Long-eared myotis (*Myotis evotis*)	BS
Long-legged myotis (*Myotis volans*)	BS
Occult little brown bat (*Myotis lucifugus occultus*)	BS
Small-footed myotis (*Myotis ciliolabrum*)	BS
Spotted bat (*Euderma maculatum*)	BS/ST
Yuma myotis (*Myotis yumanensis*)	BS
Pale Townsend's (*Plecotus townsendii pallescens*)	BS
Ferruginous hawk (*Buteo regalis*)	BS
Loggerhead shrike (*Lanius ludovicianus*)	BS
Northern goshawk (*Accipiter gentilis*)	BS
Western burrowing owl (*Athene cunicularia hypugea*)	BS
Bald eagle *(Haliaeetus leucocephalus*)	FT/ST
American peregrine falcon (*Falco peregrinus anatum*)	BS/ST
Arctic peregrine falcon (*Falco peregrinus tundrius)*	BS
Southwestern willow flycatcher (*Empidonax traillii extimus*)	FE/SE
Gray Vireo (*Vireo vicinior*)	ST
White-faced ibis (*Plegadis chihi*)	BS
Whooping crane (Grus americana)	XN/SE
Common Black-hawk (*Buteo gallus anthracinus*)	ST
Broad-billed hummingbird (*Cynanthus latirostris magicus*)	ST
Baird's sparrow (*Ammodramus bairdii*)	BS/ST
Yellow-billed cuckoo (*Coccyzus americanus*)	BS
Flathead chub (*Platygobio gracilis*)	BS
Rio Grande silvery minnow (Hybognathus amarus)	FE/SE
Rio Grande sucker (*Catostomus plebeius*)	BS
Jemez Mountain salamander (*Plethodon neomexicanus*)	BS/ST
New Mexico silverspot butterfly (*Speveria nokomis nitocris*)	BS
San Ysidro tiger beetle (*Cicindela willistoni funaroi*)	BS
William Lar's tiger beetle (*Cicindela fulgida williamlarsi*)	BS
Wrinkled marshsnail (*Stagnicola caperatus*)	SE
Gypsum phacelia (*Phacelia sp.*)	BS
Gypsum townsendia (*Townsendia gypsophila*)	BS
Knight's milk-vetch (*Astragalus knightii*)	BS
Parish's alkali grass *(Puccinellia parishii*)	BS
Wood lily (*Lilium philadelphicun*)	SE

FE = Federal Endangered, FT = Federal Threatened, XN = Nonessential experimental, BS = BLM sensitive (FWS-Species of Concern), ST = State Threatened, SE = State Endangered.

The Southwestern Willow Flycatcher, Bald Eagle, Whooping crane, and Rio Grande silvery minnow which are state listed species are also Federally listed species and have already been evaluated (refer to Biological Evaluation).

Background:

Healthy Rangeland: By implementing the conservation easements, it is anticipated that healthy rangelands would be maintained within the land exchange area.

Riparian Habitat Management: Only small isolated riparian habitats (e.g., around stock tanks) were located within the land exchange area.

Habitat Requirements: Many of these species require very specific habitats or a combination of habitats (e.g., riparian, aquatic, old growth forest, etc.) which provides the appropriate food, water and cover for survival. If the habitats necessary for the survival of particular species are not present within an area then it is assumed that the species associated with those habitats would not be present within the area. Example: A location within Sandoval County has no aquatic habitat identified within the area, consequently the Rio Grande Silvery Minnow, which occurs in Sandoval County and requires aquatic habitat to survive, would not be present and a "No Affect" determination would be appropriate.

The land exchange area was evaluated for the following specific habitat requirements to determine if certain special status species would be present within an allotment. However, many of these specific habitats were not found on BLM administered lands within the grazing allotments surveyed.

Prairie dog colonies
Riparian/wetland/Aquatic habitats
Cliff habitat
Forest (piñon/juniper, ponderosa pine) habitats
Canyon habitat

Known Distribution: Many species have only been found in very localized situations within New Mexico (e.g., Jemez Mountain salamander-known only from high elevation in the Jemez Mountains) and would not be found on in locations outside of their specific known areas.

Accidental Migrants: Several of these species are rare or accidental migrants to northern New Mexico (e.g., White-faced ibis, common black hawk, Arctic peregrine falcon etc.). These species are only rarely seen within northern New Mexico (a few times a year) consequently it is very unlikely that these species would ever be found within the land exchange area.

Special Status Species Evaluation:

Healthy Rangeland: By maintaining a healthy rangeland condition, managing livestock grazing activities so as not to contribute to any vegetation degradation, and protecting riparian areas, a "May Affect-Not Likely to Adversely Affect" determination is appropriate for the following species.

Big free-tailed bat *(Nyctinomops macrotis*)	BS
New Mexico meadow jumping mouse *(Zapus hudsonius luteus*)	BS/ST
Fringed Myotis (*Myotis thysanodes*)	BS
Long-eared myotis (*Myotis evotis*)	BS
Long-legged myotis (*Myotis volans*)	BS
Occult little brown bat (*Myotis lucifugus occultus*)	BS
Small-footed myotis (*Myotis ciliolabrum*)	BS
Spotted bat (*Euderma maculatum*)	BS/ST
Yuma myotis (*Myotis yumanensis*)	BS
Pale Townsend's (*Plecotus townsendii pallescens*)	BS
American peregrine falcon (*Falco peregrinus anatum*)	BS/ST
Arctic peregrine falcon (*Falco peregrinus tundrius)*	BS
Ferruginous hawk (*Buteo regalis*)	BS
Loggerhead shrike (*Lanius ludovicianus*)	BS
Western burrowing owl (*Athene cunicularia hypugea*)	BS
Gray Vireo (*Vireo vicinior*)	ST
Common Black-hawk (*Buteo gallus anthracinus*)	ST
Broad-billed hummingbird (*Cynanthus latirostris magicus*)	ST
Baird's sparrow (*Ammodramus bairdii*)	BS/ST
New Mexico silverspot butterfly (*Speveria nokomis nitocris*)	BS
San Ysidro tiger beetle (*Cicindela willistoni funaroi*)	BS

William Lar's tiger beetle (*Cicindela fulgida williamlarsi*)	BS
Gypsum phacelia (*Phacelia sp.*)	BS
Gypsum townsendia (*Townsendia gypsophila*)	BS
Knight's milk-vetch (*Astragalus knightii*)	BS
Parish's alkali grass *(Puccinellia parishii*)	BS
Wood lily (*Lilium philadelphicun*)	SE

Riparian: Only small isolated riparian/aquatic habitats were identified within the area (e.g., around stock tanks) none of the size necessary to support any of the following species. Consequently a "No Affect" determination is appropriate for the following species.

Yellow-billed cuckoo (*Coccyzus americanus*)	BS
White-faced ibis (*Plegadis chihi*)	BS
Flathead chub (*Platygobio gracilis*)	BS
Rio Grande sucker (*Catostomus plebeius*)	BS
Rio Grande silvery minnow (Hybognathus amarus)	FE/SE
Wrinkled marshsnail (*Stagnicola caperatus*)	SE

Habitat Requirements: All of the following species require very specific habitats or a combination of habitats (e.g., old growth forest, large cottonwood gallery forest, etc.) that are lacking within the land exchange area. Consequently a "No Affect" determination is appropriate for the following species.

American martin (Martes americana origenes)	ST
Northern goshawk (*Accipiter gentilis*)	BS
Common Black-hawk (*Buteo gallus anthracinus*)	ST
Wrinkled marshsnail (*Stagnicola caperatus*)	SE
Wood lily (*Lilium philadelphicun*)	SE

Known Distribution: The following species have only been found in very localized situations within New Mexico and would be very unlikely to be found within the land exchange area which is outside of their specific known habitat. Consequently a "No Affect" determination is appropriate for the following species.

Goat Peak pika (*Ochotona princeps nigrescens*)	BS
Jemez Mountain salamander (*Plethodon neomexicanus*)	BS/ST

Accidental Migrants: These species are rare or accidental migrants to northern New Mexico. Because these species are only rarely seen within northern New Mexico (a few times a year) it is very unlikely that these species would even use the land exchange area. Consequently a "No Affect" determination is appropriate for the following species.

White-faced ibis (*Plegadis chihi*)	BS
Common Black-hawk (*Buteo gallus anthracinus*)	ST
Arctic peregrine falcon (*Falco peregrinus tundrius)*	BS

Based on Environmental Assessment for land exchange and taking into account healthy rangelands, riparian habitat management, known distribution, rare/accidental migrants, and specific habitat requirements, the BLM has determined that implementation of the proposed action for the land exchange identified within the Environmental Impact Statement, would create a "No Affect" or a "May Affect-Not Likely to Adversely Affect" situation for all of these Special Status Species.

APPENDIX E

HYDROGEOLOGIC SETTING OF PROPOSED FEDERAL LAND EXCHANGE AREA

HYDROGEOLOGIC SETTING OF PROPOSED FEDERAL LAND EXCHANGE AREA IN THE EASTERN HAGAN BASIN, SANDOVAL AND SANTA FE COUNTIES, NEW MEXICO

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For the Bureau of Land Management, Albuquerque Field Office

This report provides a brief overview of the hydrogeologic conditions and aquifer potential of the eastern Hagan basin (Hagan embayment of Kelly, 1977) near the Sandoval-Santa Fe County line. The Hagan embayment is a southeastern extension of the Santo Domingo Basin of the Rio Grande rift structural province (Hawley, 1978).

The area described in this report is located in parts of Townships 13 and 14 North and Ranges 6 and 7 East. It extends southward from the Pueblo of Santo Domingo Reservation to near the Hagan and Puertocito townsites. The westernmost boundary is at the ruins of Tonque Pueblo (adjacent to the Pueblo of San Felipe); and the eastern border is along the western edge of Santa Fe County. The attached list of references includes most of the detailed information on the geology and water resources of the area described.

The Hagan basin is an east-tilted block of the earth's crust (or half graben) between the northern Sandia Mountains and Cuchillo de San Franciso on the west and faults (Rosario-La Bajada Zone) bounding the Cerrillos Uplift and Mesita de Juana Lopez on the east. The Hagan embayment is that part of the Hagan basin which is located between Espinaso Ridge and the La Bajada-Rosario fault zone. This triangular-shaped area opens northward into the eastern Santo Domingo Basin north of Interstate 25. The general hydrogeologic map and diagrammatic section AA' attached illustrate the basic geologic structure and topography of the area.

The initial stage of Hagan basin formation was a product of subsidence of a large northeast-trending block of the earth's crust during the early Cenozoic Laramide interval of mountain building in the Southern Rocky Mountain region. This deformation was associated with convergence and lateral movement of the tectonic plates that formed the western North American Continent at the time (Cather, 1992,1999). Older (Mesozoic and Paleozoic) sedimentary rocks of both marine and continental origin were deeply down-warped and down-faulted as the early Hagan basin subsided. The sandstones, mudstones and conglomerates of the Galisteo Formation that filled this basin are derived from surrounding highlands that now are preserved in only a few places notably in parts of the southern Sangre de Cristo, Nacimiento, and Manzano ranges.

The next major geologic unit preserved in the eastern Hagan basin is the volcaniclastic Espinaso Formation of Oligocene age. The present Ortiz Mountains and nearby igneous-intrusive highlands extending north from South Mountain to the Cerrillos Hills are the erosional remnants of the large volcanic centers that were the source areas of the Espinaso Formation sediments and associated volcanic flow units. The volcaniclastic sediments that make up most of the Formation have a dense mudstone matrix. Smaller bodies of intrusive igneous rocks (dikes, sills, and plugs) are also present. The type area for the Formation is at Espinaso Ridge, where the unit is transitional downward into the Galisteo Formation on the western and southern parts of the ridge.

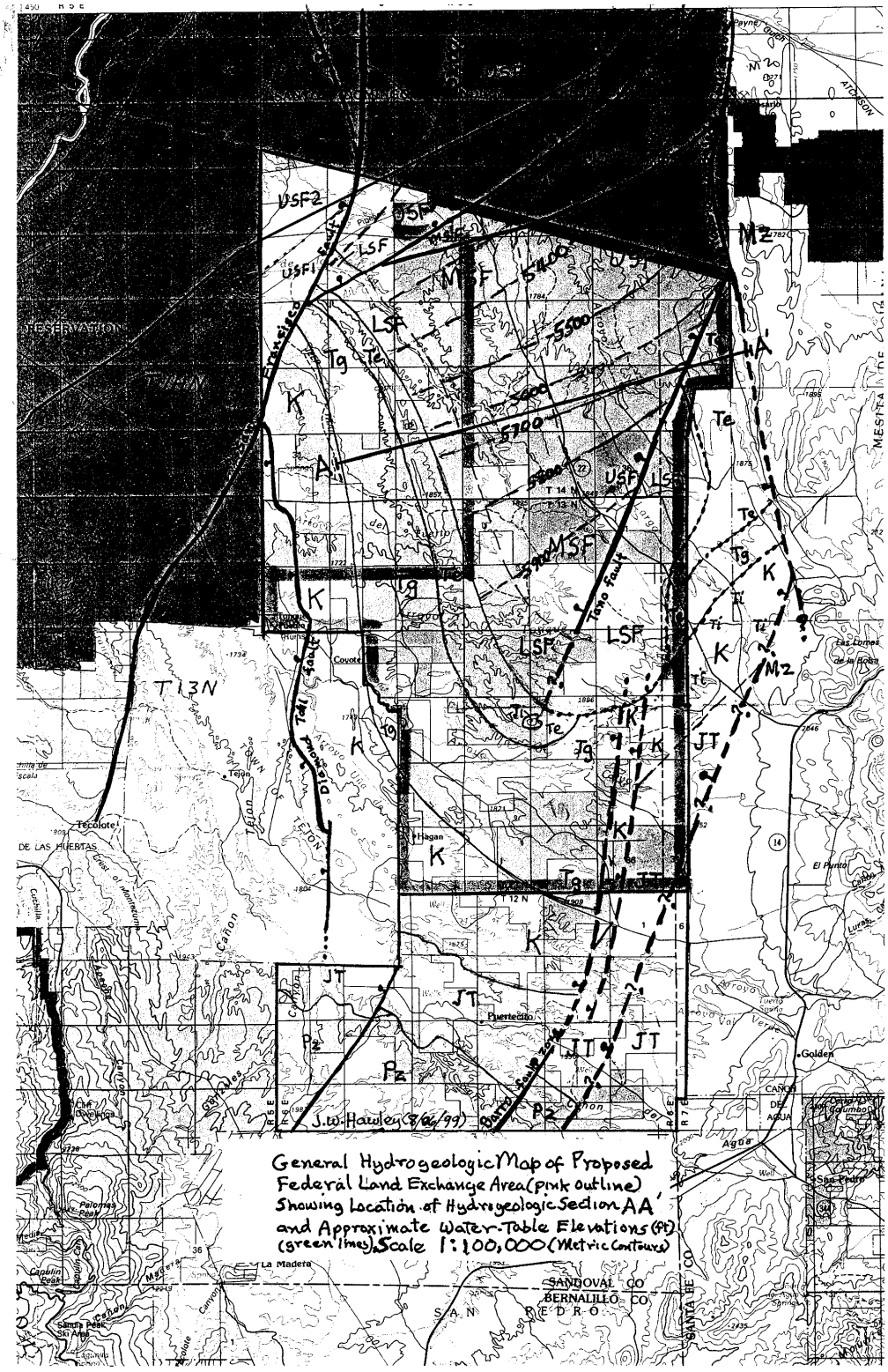
The sandstones and conglomerates of the Galisteo Formation have some potential for domestic and stockwater production from very localized groundwater sources. However, the Espinaso Formation has very limited potential, if any, for groundwater production, and it primarily serves as an aquiclude or aquitard.

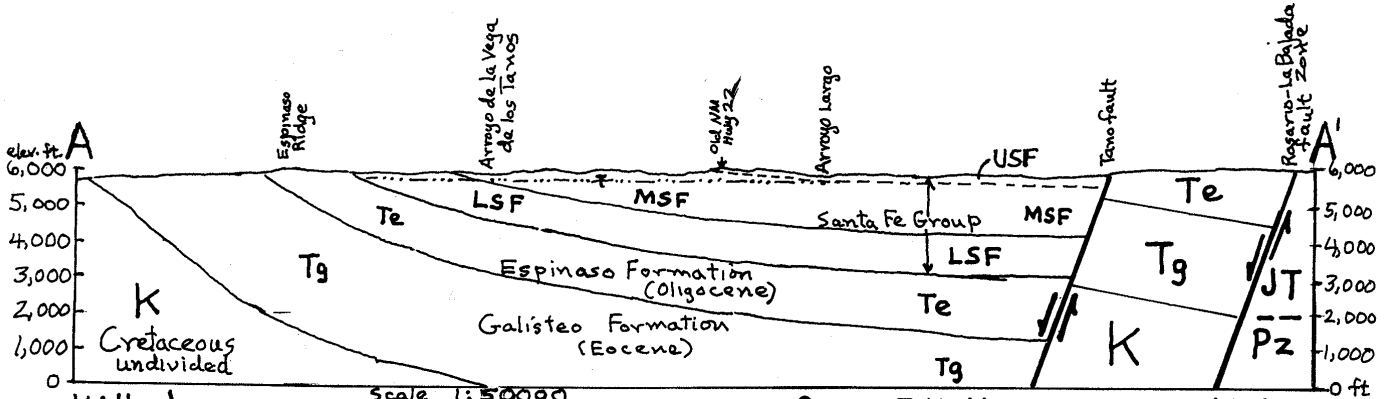
The major aquifer units in the area comprise basin fill deposits of the Upper Cenozoic Santa Fe Group. These sediments, and associated basaltic and rhyoltic volcanics, were emplaced during a long interval of earth-crustal extension (continuing to the present) that produced today's Basin and Range topography at the southern margin of the Southern Rocky Mountain province. This region includes the very deep (Rio Grande rift) structural depression between the Colorado Plateau and Great Plains provinces of north-central New Mexico. The Santa Domingo Basin and the Hagan Embayment-half graben (see map and cross section)form the northeastern extension of the Albuquerque Basin, which is the largest and deepest part of the rift-basin complex.

Early stages of the Rio Grande rift (RGR) extension in late Oligocene and early Miocene time (about 25 to 15 million years ago) are represented by partly indurated deposits of the Lower Santa Fe Group (LSF) hydrostratigraphic unit (Hawley and Haase, 1992; Hawley et al., 1995), that are characterized by fine to medium-grained textural groups (clays, silty sands, and interbedded sands and silty clays, with local conglomeratic or gravelly zones; lithofacies assemblages 3, 4, 5, 7 on Table 1). Aquifer potential is low to moderate.

The main interval of RGR basin subsidence occurred between 7 to 15 million years ago (middle and late miocene time). The very thick basin fills deposited during this period were derived from emerging mountain highlands of the entire upper Rio Grande basin region. The Middle Santa Fe Group (MSF) hydrostratigraphic unit is generally coarser grained than the underlying LSF unit; but it is still partly indurated. Weakly cemented sandstones, siltstones, and conglomeratic sandstones and siltstones are major rocktypes; and soft sandy mudstones and silty clays are locally present. Dominant lithofacies assemblages (Table 1) are units 5, 6, 7, and 8. The MSF hydrostratigraphic unit correlates with the Tesuque Formation of the Espanola Basin and Santa Fe area, and it has a moderate to low aquifer potential (saturated horizontal hydraulic conductivities in 1 to 5 ft/day range). However, the saturated thickness of the MSF unit may locally range from 1,000 to 2,000 feet (see cross section). Transmissivity values, therefore, could be large and production of very deep wells could be potentially good (depending of course on quality of well design and construction). The most recent groundwater-flow model of the Albuquerque basin (Kernodle et al. 1995, plate 1.) assigns hydraulic conductivities of no more than 4 feet/day for the Santa Fe Group deposits in the Hagan embayment section of the Santo Domingo Basin.

Overlying Upper Santa Fe Group (USF) and younger stream-valley and basin-fill deposits are mostly in the unsaturated (vadose) zone, and they are only locally potential sources of groundwater production. Post-Santa Fe Group deposits are usually less than 100 feet thick and are not shown on the attached map and cross section.


USF2
USF
LSF
MSF
5400
5300
5600
5700
5800
A
A'
Tg
Te
K
JT
Pz
T13N
T12N
Tonto fault
Tijeras fault
Piedra Lumbre fault
Hagan
Tecolote
Golden
Pueblo
La Madera
SANDOVAL CO
BERNALILLO CO
SAN PEDRO
SANTA FE CO
J.W. Hawley (8/06/99)
General Hydrogeologic Map of Proposed Federal Land Exchange Area (pink outline) Showing Location of Hydrogeologic Section AA' and Approximate Water-Table Elevations (ft) (green lines). Scale 1:100,000 (Metric Contours)



Bedrock Units (pre-Rio Grande rift basin-fill)

- **Te** — Espinaso Formation (not an aquifer): volcaniclastic and interbedded volcanic and intrusive igneous rocks
- **Tg** — Galisteo Formation (local aquifer): primarily sandstone and mudstone, and some conglomerate

Mesozoic Bedrock Units

- **K** — Upper Cretaceous Rocks–Undivided: marine and non-marine shales and sandstones, with some coal beds
- **JT** — Jurassic and Triassic Rocks–Undivided: primarily sandstones and mudstones, with some gypsum and limestone

Basin-Fill Hydrostratigraphic Units

- **USF** — Upper Santa Fe Group (upper Miocene & Pliocene)
- **MSF** — Middle Santa Fe Group (Miocene)
- **LSF** — Lower Santa Fe Group (upper Oligocene–Lower Miocene)
- –···– Approximate water-table position (near USF/MSF contact between Arroyo Largo and Tano fault)

Paleozoic Bedrock Units

- **Pz** — Permian Rocks–Undivided: primarily sandstone, mudstone and limestone

Diagrammatic Hydrogeologic Section of Hagan Embayment Between Espinaso Ridge and the Cerrillos Uplift (Across Proposed Federal Land-Exchange Area in T 13-14 N, R 6-7 E, Sandoval and Santa Fe Counties, NM

TABLE E-1

Lithofacies	Ratio of sand plus gravel to silt plus clay[1]	Bedding thickness (meters)	Bedding configuration[2]	Bedding continuity (meters) [3]	Bedding connectivity [4]	Hydraulic conductivity (K) [5]	Groundwater production potential
1	High	>1.5	Elongate to planar	>300	High	High	High
2	High to moderate	>1.5	Elongate to planar	>300	High to moderate	High to moderate	High to moderate
3	Moderate	>1.5	Planar	150 to 300	Moderate to high	Moderate	Moderate
4	Moderate to high	>1.5	Planar to elongate	30 to 150	Moderate to high	Moderate	Moderate
5	Moderate to high	0.3 to 1.5	Elongate to lobate	30 to 150	Moderate	Moderate to low	Moderate to low
5a	High to moderate	0.3 to 1.5	Elongate to lobate	30 to 150	Moderate	Moderate	Moderate
5b	Moderate	0.3 to 1.5	Lobate	30 to 150	Moderate to low	Moderate to low	Moderate to low
6	Moderate to low	0.3 to 1.5	Lobate to elongate	30 to 150	Moderate to low	Moderate to low	Moderate to low
6a	Moderate	0.3 to 1.5	Lobate to elongate	30 to 150	Moderate	Moderate to low	Moderate to low
6b	Moderate to low	0.3 to 1.5	Lobate	<30	Low to moderate	Low to moderate	Low
7	Moderate*	0.3 to 1.5	Elongate to lobate	30 to 150	Moderate	Low	Low
8	Moderate to low*	>1.5	Lobate	<30	Low to moderate	Low	Low
9	Low	<0.3	Planar	>150	Low	Very low	Very low
10	Low	<0.3	Planar	>150	Low	Very low	Very low

[1] High >2;moderate 0.5; low <0.5
[2] Elongate (length to width ratios>5); planar (length to width rations 1-5); lobate (asymmetrical or incomplete planar beds).
[3] Measure of the lateral extent of an individual bed of given thickness and configuration.
[4] Estimate of the ease with which groundwater can flow between indivudual beds within a particular lighofacies. Generally, ghgh sand+gravel/silt+clay ratios, thick beds, and high bedding continuity favor high bedding connectivity. All other parameters being held equal, to greater the bedding connectivity, the greater the groundwater production potential of a sedimentary unit (Hawley and Haase, 1992, p. VI).
[5] High 10 to 30 m/day;moderate, 1 to 10 m/day; low, <1 m/day; very low, <0.1 m/day.
[*]Significant amounts of cementation of coarse-grained beds (as much as 30%)

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APPENDIX F

GLOSSARY OF TERMS

best management practices. Best management practices or BMPs means schedules of activities, prohibitions of certain practices, implementation of maintenance procedures, or other measures of practices approved by the New Mexico Environment Department or a designated management agency to prevent or reduce the pollution of waters of the State.

conservation easement. A legal agreement a property owner makes to restrict the type and amount of development that may take place on his or her property. Each easement's restrictions are tailored to the particular property and to the interests of the individual owner.

edge holdings. Land adjoining Special Management Areas.

escrow. Delivery of a document to a third party, in trust, to be delivered to the benefited party upon satisfaction or performance of certain specified conditions.

fee lands. (See **in fee simple)**.

fee simple. Absolute ownership of real estate or real property.

in fee (simple). Refers to an estate in fee simple absolute; an unqualified freehold estate (unconditional ownership)

inholdings. Private or State-owned land inside the boundary of a Wilderness Study Area (or Special Management Area) but excluded from it.

lithic scatter. Concentration of stone artifacts.

neotropical. Zoogeographical (the science of geographical distribution of animals) region which includes South and Central Americas, Mexico, and the West Indies.

patent reservation. A provision in a conveyance document excepting and retaining some rights, title, or interest in the lands conveyed, which were not previously reserved or granted but which are required or authorized by law to be retained.

physiography (physical geography). The study of the genesis and evolution of land forms.

restrictive covenant. (Legal term)--a private agreement, usually in a deed or lease, that restricts the use and occupancy of real property, especially by specifying lot size, building lines, etc., and the uses to which the property may be put.

species, endangered. Any species which is in danger of extinction throughout all or a significant portion of its range other than a species of the Class Insecta determined by the Secretary to constitute a pest whose protection under the provisions of the Act would present an overwhelming and overriding risk to man.

species, proposed. Any species of fish, wildlife or plant that is proposed in the Federal Register to be listed under Section 4 of the Endangered Species Act.

species, candidate. Any species being considered for possible addition to the list of Endangered and Threatened Species. These are taxa for which the Fish and Wildlife Service has on file sufficient information on biological vulnerability and threat(s) to support issuance of a proposal to list, but issuance of a proposal rule is currently precluded by higher priority listing actions.

species of concern. Any species for which current information indicates to the Fish and Wildlife Service that proposing to list the species as Endngered or Threatened is possibly appropriate, but for which substantial data on biological vulnerability and threat(s) are not currently known. Species of Concern receive no legal protection and the use of the term does not necessarily mean that the species will eventually be proposed for listing as a Endangered or Threatened species.

species, threatened. Any species which is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range.

stratigraphy. The study of the formation, composition, sequence, and correlation aof the stratified rocks as part of the earth's crust.

"subject to" clause. Clause in a conveyance identifying those rights uses, and interests in the lands being conveyed which are outstanding in third parties.

subsurface right. A landowner's right to the minerals and water below his or her property.

surface estate. Surface rights--all rights in the land excepting oil, gas, and mineral rights to underground deposits.

trust land. Property held by the United States in trust for an Indian Tribe or individual Indian.

APPENDIX G

MAILING LIST FOR
DRAFT LAND EXCHANGE EIS

Mike Aaron
Charles Aguilar
Pete Aguilar
Rick Allen & Lynn
Beverly Anataeus
Elizabeth Andrews
Carolyn Appelman
Antonio Archuleta & Jose
Robert Armijo
Bernadino Armijo
Rudolpho Armijo & Joe Jr.
Michael Atler
Alfredo Baca
Joe Baca
Edmund Ball
Ty Belknap
Jeff Bingaman, Senator
Nancy Brantley
Gwen Brewer
Bureau of Indian Affairs
Jay Burkett
Brian Burnett
Lyle Burrington
Canon De Aqua
Cecil Carnes
Eva Castillo
Steve Cather
Phillip Chappel
Ralph Chavez
Lawrence Chavez
Anna Chavez-Montano
Michele Chisholm
A. Coleman
Community City of Albuq
Cortez Pipeline Co.
Diamond Tail Limited
Lloyd Doggett, The Honorable
Pete Domenici, Senator
Leanne Duree
Starley Duwyenie & Elisa
Mark Edwards
Equilon Pipeline Co.
Fed. Hwy Administration
Gas Company of NM
Beatriz Galaviz
Melisandro Garcia & Rumaldito
John George
David Gomey
Moises Gonsalez
Eutimio Gonzales
Ruben Gonzales
Skipper Good
Sid Goodloe
Catherine Gradi
Fred Gross Jr.
Art Gurule
Lee Halterman
Stephanie Ham
Steve Harris
Richard Herrera
Manuel Herrera
Harriet Hope-Miner
John Horning
Shannon Horst
David Hugh Kincaid
Richard Hughes
Rick Hurley
Kay Hutchison
Mary Jaramillo
Gary Johnson, Governor
Andy Johnson
John Kennedy
Virginia Kinney
Jerry Knepper
L. Dreyfus Natural Gas
Barbara Levin
Carolyn Loder
Connie Martinez
John McCarthy
Steve McDowell
Merrion O&G Corp.
Hale Metzner & Peter
Mid-America Pipeline Co.
Manuel Montano
Hilario Montano
Samuel Montano
Joseph Montano & Cleofas
Antonio Montano
Joseph Montano
Danny Montano
Michael Montano
Louis Montano
Eloisa Montano-Fernandez
Rita Montano-Garcia
Orville Moore
Joe Moya & Catre
NIC Zamier, Inc.
NM State Highway Dept
NM State Land Office
Frances Newson
Frank Nordstrom
Pueblo of San Felipe
Duncan Osborne
PNM ROW Dept.
Flora Padilla
Fred Parker
Carol Parker
Van Perkins
Tom Petencin
Roger Peterson
Plains Electric G&T Coop
Susan Protiva
Pueblo of Santa Ana
Pueblo of Santo Domingo
Joseph Quintana
Shawn Redfield
John Salazar
Edward Salazar & Ernestine
Sandoval County Manager
Sanford Schemnitz
Santa Fe County Manager
Laurie Sedlmayr
Milton Seligman
Jack Seligman
R. Seligman
Julia Seligman & Milton
Barbara Seward
Buddy Shaw
George Sherman
Yvonne Smith
Geoffrey Steward & Caplan, Jessica & W. Harry
Geoffrey Stewart
Linda Talley-Branch
Steven Thompson
Larry Trujillo
Willie Trujillo
Sil Verde
William Waldman
Marvin Watts
John Wender
Bob Wessely
Phillip West
Western Land Exchange Project
Charles Williams
Heather Wilson, Congresswoman

APPENDIX H

SANTO DOMINGO LAND EXCHANGE
NMNM 101521
FEDERAL LAND - LEGAL LAND DESCRIPTION

NEW MEXICO PRINCIPAL MERIDIAN

Land Description	Acreage
T. 13 N., R. 6 E.,	
sec. 1, lots 5	38.06
6	40.23
7	6.31
13	25.63
	110.23
T. 14 N., R. 6 E.,	
sec. 9, lots 9	22.57
10	11.99
S½;	320.00
	354.56
sec. 10, lots 10	6.05
11	17.86
12	29.68
13	41.49
S½S½;	160.00
	255.08
sec. 11, lots 9	34.65
10	25.73
11	17.83
	78.21
sec. 13, lots 5	19.90
6	30.99
7	48.80
8	37.71
S½NW¼,	80.00
S½;	320.00
	537.40
sec. 14, lot 2	38.56
NW¼NE¼,	40.00
S½NE¼,	80.00
NW¼,	160.00
S½;	320.00
	638.56
sec. 15, all;	**640.00**

sec. 22, lots	1	41.85
	5	29.30
	6	19.37
		90.52
sec. 23, lots	1	39.74
	2	39.69
	3	36.58
	4	39.88
	N½	320.00
	SE¼	160.00
		635.89
sec. 24, all;		**640.00**
sec. 25, all;		**640.00**
sec. 26, lots	1	40.17
	2	13.11
	6	26.09
	7	40.74
	8	40.59
	9	10.09
	15	36.94
	16	40.69
	NE¼	160.00
		408.42
sec. 35, lots	1	40.15
	2	31.16
	5	24.54
	6	40.39
	7	39.97
	8	10.82
	11	35.87
		222.90

T. 13 N., R. 7 E.,

sec. 6, lots	5	40.08
	6	25.05
	7	24.93
	8	40.13
	9	40.14
	10	24.75
	11	24.56
	12	39.90
		259.54
sec. 7, lots	5,	31.12
	6	24.37
	7,	24.10
	11,	13.60
		93.19

T. 14 N., R. 7 E.,

sec. 17, lots	10	7.40
	11	9.78
		17.18

sec. 18, lots	5	29.35
	6	18.70
	7	37.42
	8	48.06
	SW¼,	160.00
	S½SE¼;	80.00
		373.53
sec. 19, all;		**640.00**
sec. 20, lots	1	10.01
	2	10.28
	3	10.54
	4	10.81
		41.64
sec. 29, lots	1	11.06
	2	5.43
		16.49
sec. 30, lots	1	39.00
	2	19.60
	3	19.45
	4	34.21
	5	29.15
	N½N½,	160.00
	SW¼NW¼,	40.00
	W½SW¼;	80.00
		421.41
sec. 31, lots	1	25.75
	2	25.39
	3	25.28
	4	25.17
	W½W½.	160.00
		261.59

TOTAL ACREAGE (Sandoval & Santa Fe Counties) **7,376.34**

APPENDIX I

SELECTED LAND RESERVATIONS (BLM/Santo Domingo Exchange)

EXCEPTING AND RESERVING TO THE UNITED STATES:

1. A right-of-way thereon for ditches or canals constructed by the authority of the United States pursuant to the Act of August 30, 1890 (43 U.S.C. 945);

2. A right providing that prior to any surface disturbance or any other activity on the lands conveyed hereby having the potential to affect historic properties on such lands, Grantee shall obtain express written approval from the Bureau of Indian Affairs indicating that effects on historic properties have been taken into account consistent with the provisions of the National Historic Preservation Act, (P.L. 89-665; 80 Stat. 915; 16 U.S.C. 470; as amended), and shall comply fully with the provisions of such Act; but the Bureau of Indian Affairs may extinguish this proviso for all or any portion of the lands conveyed hereby upon determination that provisions of the Act have been fully satisfied, and furthermore this proviso shall expire with respect to any of the lands conveyed hereby, as of the date such lands are conveyed to the United States in trust for the benefit of the Grantee.

3. Those rights for a powerline granted to Public Service Company of New Mexico, its successors or assigns, by right-of-way NMNM 036231, pursuant to the Act of March 4, 1911, as amended (43 U.S.C. 961), as to lot 7, S2NW, NWSW, sec. 13, E2SE, SWSE, sec. 14, a portion within the E2SE, sec. 22, and NWNE, NENW, S2NW, NWSW, sec. 23, T. 14 N., R. 6 E.;

4. Those rights for a powerline granted to Public Service Company of New Mexico, its successors or assigns, by right-of-way NMNM 30521, pursuant to the Act of October 21, 1976 (43 U.S.C. 1761), as to the SESE, sec. 13, a portion of the NESE, sec. 22, N2, NWSW, sec. 23, NWNE, N2NW, sec. 24, T. 14 N., R. 6 E., and lot 10, sec. 17, lots 7, 8, S2SW, sec. 18, T. 14 N., R. 7 E.;

SUBJECT TO:

1. Valid existing rights-of-way and easements;

2. Those rights for a gas pipeline granted to Gas Company of New Mexico, its successors or assigns, by right-of-way NMSF 062654, pursuant to the Act of February 25, 1920, as amended (30 U.S.C. 185), as to lot 9, N2SW, sec. 9, T. 14 N., R. 6 E.;

3. Those rights for a road which is claimed by the New Mexico State Highway Department, or its assigns, pursuant to Rev. Stat. 2477 (43 U.S.C. 932), and assigned Bureau of Land Management Serial No. NMNM 57898 for identification, as to the SE, sec. 1, T. 13 N., R. 6 E., lots 12, 13, S2SW, sec. 10, W2NE, E2NW, W2SE, sec. 15, N2NE, SENE, E2SE, sec. 22, SWSW, sec. 23, N2NW, SENW, SESW, W2SE, sec. 26, E2, sec. 35, T. 14 N., R. 6 E., and SWSW, sec. 6, lots 2, 3, W2NW, sec. 7, T. 13 N., R. 7 E.;

4. Those reservations contained in a Reservation of Conservation Easement document recorded on _____, 2000.

RESERVATION OF CONSERVATION EASEMENT

Provided, however, that the lands conveyed herein, *except* those lands situated in Sections 25, 26 and 35, Township14 North, Range 6 East NMPM (which are herein referred to as the "Excepted Lands"), shall forever be subject to the following Restrictions, which are intended to preserve such lands in their natural state for the benefit of Grantee and its members, and Grantor shall retain forever the right to enforce such Restrictions, as set forth herein:

Restrictions: The Grantee shall have no right to conduct, or to allow any other persons or entity to conduct, any of the following activities on or with respect to any of the lands that are subject to these provisions (which lands are hereinafter referred to as the "Subject Lands"):

1. The storage, dumping, disposal, release or other use of toxic and/or hazardous materials or the storage, dumping, disposal or release of non-compostable refuse.

2. Any filling, excavating, dredging, mining, drilling and exploration for or extraction of any minerals, hydrocarbons, soils, sand, gravel, rock or other materials on or below the surface; except that nothing herein shall pertain to the activities of any utility company that is granted a valid right-of-way across the lands conveyed herein or any portion of them for installation of a utility line for the transmission of electrical power, telephone service or natural gas, provided that Grantee shall consult with Grantor with respect to: a) the location of any proposed utility right-of-way affecting the Subject Lands, and b) the necessary restoration of lands affected by construction activity on such right-of-way and adjacent lands, prior to consenting to such right-of-way; nor shall anything herein preclude Grantee or any member of Grantee from taking clay or other soils or materials from any of the lands conveyed herein for their use in making pottery, or for any other traditional craft or religious purpose).

3. Any division, subdivision or *de facto* subdivision of the property.
4. Construction of roads.
5. Severance or transfer of any water rights attached to the property.
6. Construction or placement of any buildings, whether permanent or temporary, living quarters of any sort, mobile homes, signs, billboards or other advertising materials, or utility towers or other structures.

Rights of Enforcement: Grantor, through the Bureau of Indian Affairs or its successor agency, shall have the right to enter upon the Subject Lands to enforce the provisions of these Restrictions, and to determine that Grantee's activities are in compliance therewith, all upon prior notice to Grantee and in a manner that does not unreasonably disturb the use of the property by Grantee, consistent with the terms of these Restrictions. Grantor shall also have the right of immediate entry upon the Subject Lands if, in its sole judgment, such entry is necessary to prevent damage to or the destruction of the values protected by these Restrictions. Grantor shall further have the right to take any appropriate legal measure to enjoin any activity on or any use of the property by Grantee or any of its members or any person or entity purporting to act under its permission or authority that is in clear violation of these Restrictions and to enforce the restoration of such areas or features of the Subject Lands that may have been damaged by such activities.

General Provisions: Nothing herein shall be construed as affording to any member of the public any access or right of access to any portion of the lands conveyed herein, or as authorizing Grantor to grant any such right of access to any third person without the express prior written consent of Grantee.

The provisions of these Restrictions and Reservations shall be liberally construed to effectuate their purposes of conserving important habitat for wildlife, to protect rare or unique native plants now or later identified, to conserve the diverse vegetative communities and the wildlife inhabiting these communities, and to preserve the Subject Lands in their present, substantially undisturbed natural state, with significant topological and open-space values, in perpetuity, but without interfering with any uses of the property by the Grantee consistent with the conservation values that are protected hereby. Nothing herein shall be deemed to limit or affect Grantee's right to utilize the surface and/or minerals on or under the Excepted Lands, in such manner as Grantee chooses, including the right to lease or permit to third parties the right to utilize the surface and minerals on or under such lands in any manner that Grantee might, but Grantee shall have no right to utilize or conduct any activities on the Excepted Lands, or to permit any third party to utilize or conduct any activities on the Expected Lands, that would cause a violation of any of the above-state Restrictions with respect to the Subject Lands, and Grantor shall have the right reasonably to condition any lease or permit or other grant of rights in the Excepted Lands by Grantee to any third party so as to insure strict compliance with this provision.

APPENDIX J

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